

PRINCIPLES OF ECONOMICS

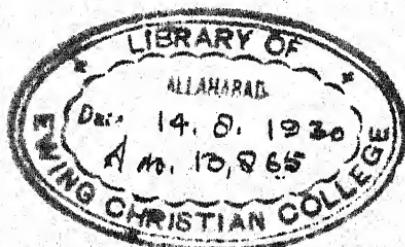
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PREFACE TO THE FIRST EDITION

I HAVE tried in this book to state the principles of economics in such form that they shall be comprehensible to an educated and intelligent person who has not before made any systematic study of the subject. Though designed in this sense for beginners, the book does not gloss over difficulties or avoid severe reasoning. No one can understand economic phenomena or prepare himself to deal with economic problems who is unwilling to follow trains of reasoning which call for sustained attention. I have done my best to be clear, and to state with care the grounds on which my conclusions rest, as well as the conclusions themselves, but have made no vain pretense of simplifying all things.

The order of the topics has been determined more by convenience for exposition than by any strict regard for system. In general, a subject has been entered on only when the main conclusions relating to it could be followed to the end. Yet so close is the connection between the different parts of economics that it has been necessary sometimes to go part way in the consideration of matters on which the final word had to be reserved for a later stage. Taxation has offered, as regards its place in the arrangement, perhaps the greatest difficulties. It is so closely connected with economics that some consideration of it seemed essential; whereas public finance in the stricter sense, whose problems are political quite as much as economic, has been omitted. Yet a suitable place for taxation was not easy to find. I concluded finally to put the chapters on this subject at the very close, even though they may have the effect of an anti-climax coming as they do after those on socialism.

The book deals chiefly with the industrial conditions of modern countries, and most of all with those of the United States. Economic history and economic development are not considered in any set chapters, being touched only as they happen to illustrate one or another of the problems of contemporary society. Some topics to which economists give much attention in

PREFACE

omitted entirely the usual chapters or sections on definition, methodology, and history of dogma; and have said little on such a topic as the subjective theory of value, which in my judgment is of less service for explaining the phenomena of the real world than is supposed by its votaries. These matters and others of the same sort are best left to the professional literature of the subject. I hope this book is not undeserving the attention of specialists; but it is meant to be read by others than specialists.

Though not written on the usual model of textbooks, and not planned primarily to meet the needs of teachers and students, the book will prove of service, I hope, in institutions which offer substantial courses in economics. The fact that it is addressed to mature persons, not to the immature, should be an argument in favor of such use rather than against it. Being neither an encyclopedic treatise nor a textbook of the familiar sort, it offers no voluminous footnotes and no detailed directions for collateral reading. When facts and figures not of common knowledge have been cited, my sources of information have been stated. At the close of each of the eight Books into which the whole is divided, I have given suggestions for further reading and study, mentioning the really important books and papers.

I have expressed in the text, as occasion arose, my obligations to the contemporary thinkers from whom I have derived most stimulus. For great aid in revising the manuscript and proof, on matters both of form and substance, I am indebted to my colleagues Drs. R. F. Foerster and E. E. Day of Harvard University.

F. W. TAUSSIG.

HARVARD UNIVERSITY,

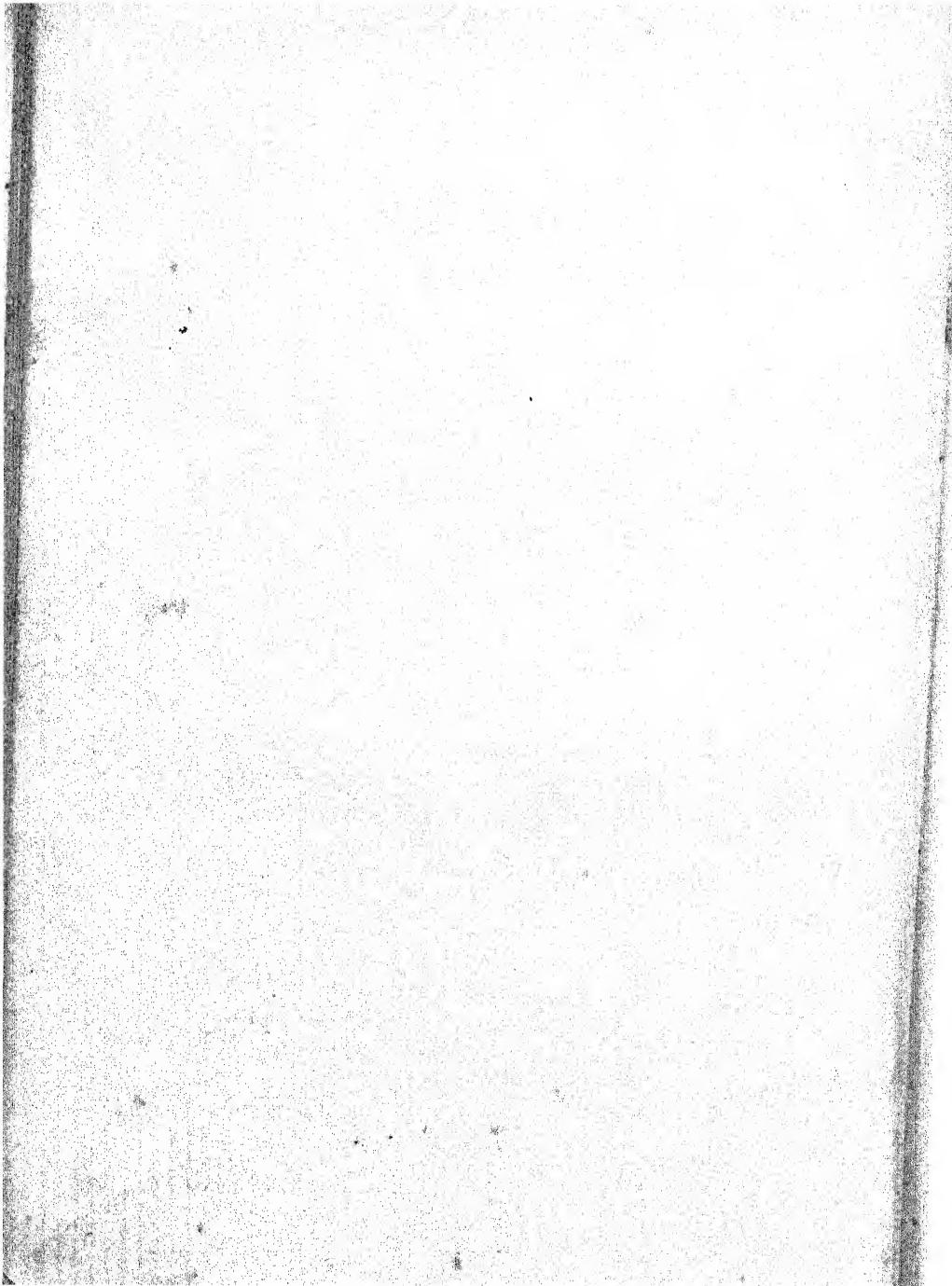
March, 1911.

PREFACE TO THE THIRD EDITION

FOR the present edition the text has been revised thruout and considerable rearrangements and additions have been made. Some passages have been transposed, notably certain sections in the chapter on Capital in Volume I, which have been shifted to the chapters on Interest in Volume II. Various passages on proposed monetary reforms which had been distributed under different heads are now brought together, and amplified with new matter, in a separate chapter on that topic. There is also a separate chapter on Great Fortunes, containing mainly new matter. In Book VI (Labor Problems) an introductory chapter on Wages and the Wages System has been added. On the other hand some sections on bimetallism and other topics of lessening importance have been omitted. The whole of the chapter in Volume II on the General Property tax has also been omitted.

The most important changes are those necessitated or suggested by the events of the Great War. The treatment of the banking system of the United States has been entirely rewritten in view of the great and rapid changes that took place during its course. That of paper money has been extended so as to include an account of the war issues. In the closing Book of Volume II, on the principles of taxation, a complete revision has led to the elimination of some details no longer apposite.

It cannot be said that the experiences of recent years have compelled any serious modification of the exposition of economic principles. On the contrary, the predictions and warnings of the economists have rather been confirmed. But the war led to quite extraordinary phenomena, which, while largely illustrative of familiar principles, have still called for some further explanations. Within the limits imposed by a book covering so wide a range of topics, I have endeavored to bring out the economic lessons of the great struggle.



CONTENTS

BOOK I

THE ORGANIZATION OF PRODUCTION

CHAPTER 1

WEALTH AND LABOR

✓ Section 1. The subject matter of economics, 3 — Sec. 2. Wealth; free goods; economic goods. Wealth and welfare, 5 — Sec. 3. Goods may become economic thru mere scarcity; but commonly do so because of the exertion of labor, 7 — Sec. 4. Activity may be irksome or pleasurable. Labor usually is continuous, monotonous, irksome, 8 — Sec. 5. Some sorts of labor always pleasurable, 10 — Sec. 6. The irksomeness of most labor to be lessened by better general opinion, and by greater leisure thru shorter hours, 12.

VOL. I
PAGES
3-14

CHAPTER 2

OF LABOR IN PRODUCTION 15-29

Section 1. Labor given to material objects deemed alone productive by earlier English economists. Objections to this view, 15 — Sec. 2. Labor creates utilities only; all labor that issues in utility is productive. Is there nonmaterial wealth? 17 — Sec. 3. Is there any unproductive labor? Labor given to things harmful, 20 — Sec. 4. Labor of judges and lawyers; of soldiers, 23 — Sec. 5. Predatory labor. "Business." The law and unproductive labor, 25.

CHAPTER 3

THE DIVISION OF LABOR AND THE DEVELOPMENT OF MODERN INDUSTRY 30-47

Section 1. Two forms of the division of labor: the simpler and the more complex, 30 — Sec. 2. Advantages from the simpler form: dexterity, continuity, adaptation to aptitudes, 31 — Sec. 3. Advantage from the more complex form: the development of machinery. The industrial revolution of the eighteenth century. The use of nature's power, 33 — Sec. 4. Division of labor means unconscious co-operation. Exchange, 37 — Sec. 5. Exchange formerly covered a limited economic area. Cheap transportation (railways) makes the area wide, 38 — Sec. 6. Wider markets bring more minute di-

vision of labor. Illustration from butcher's trade, 41 — Sec. 7. The geographical division of labor, illustrated by the United States and Great Britain, 43 — Sec. 8. Two sorts of the gain from geographical division of labor, 45.

CHAPTER 4

LARGE-SCALE PRODUCTION 48-66

✓ Section 1. Growth of large-scale production illustrated by certain industries: cotton goods, iron, agricultural implements, 48 — Sec. 2. Advantages of large-scale production: use of machinery, saving in general expenses, buying and selling, utilization of by-products, experimenting, 52 — Sec. 3. Limitations, chiefly from difficulties of superintendence. The case of agriculture. Other industries. Scarcity of able managers as a cause of limitation. This human factor usually ignored by the socialists, 54 — Sec. 4. Combination, horizontal and vertical. The Steel Corporation as an example. Other examples. The tendency to vertical combination less strong than that to horizontal, 58 — Sec. 5. Competition often wasteful; tho the waste is less than it seems. Combination rules only over part of industry, 64.

CHAPTER 5

CAPITAL 67-79

✓ Section 1. Production is spread over time. This fact disguised by the division of labor. Increasing use of plant and machinery in modern times, 67 — Sec. 2. Producer's wealth and consumer's wealth; capital, 69 — Sec. 3. Capital rests on a surplus, 71 — Sec. 4. In what sense capital rests on saving. Hoarding contrasted with saving for investment, 72 — Sec. 5. Investment means advance to laborers. Inequality of possessions in relation to advances. Middlemen for investment and advances, 75 — Sec. 6. The maintenance of capital, as well as its creation, involves saving, 77.

CHAPTER 6

THE CORPORATE ORGANIZATION OF INDUSTRY 80-91

Section 1. Partnerships and corporations. Limited liability. Corporations from the legal point of view and from the economic, 80 — Sec. 2. Advantages from corporate organization. Large-scale operations facilitated; new and venturesome investments promoted; stimulus to savings and investment, 83 — Sec. 3. Ease of transfer serves to divide risks and so promote investments, and to bring control into capable hands. But it leads to great evils: overreaching, Stock exchange gambling, control by the unscrupulous, 85 — Sec. 4.

CONTENTS

xiii

VOL. I
PAGES

Increasing importance of financial middlemen. Power of trusted bankers and managers, 89 — Sec. 5. High security of much corporate property makes the leisure class more permanent, 90.

CHAPTER 7

SOME CAUSES AFFECTING PRODUCTIVENESS 92-104

Section 1. The effect of high wages (abundant food) on the productivity of labor. High wages in the main a result, not a cause, of efficiency, 92 — Sec. 2. Effects of skill and intelligence on productivity. General education. Technical education, in its effect for the individual and for the community, 96 — Sec. 3. Leadership. The business man; the man of science. Freedom and mobility as promoting leadership. The motives to leadership, 100 — Sec. 4. The immaterial equipment of a community; how affected by training and by inheritance, 103.

REFERENCES ON BOOK I 105

BOOK II

VALUE AND EXCHANGE

CHAPTER 8

INTRODUCTORY: EXCHANGE, VALUE, PRICE 109-115

Section 1. Exchange the consequence of the division of labor, 109 — Sec. 2. Money as the medium of exchange, 110 — Sec. 3. Value and utility. The notion of value in exchange, 111 — Sec. 4. A general rise in values; a general rise in prices. Stability in general prices provisionally assumed, 113.

CHAPTER 9

VALUE AND UTILITY 116-133

Section 1. Utility a necessary condition of value; but value not proportional to utility, 116 — Sec. 2. Increase of supply brings lowering of value; because of differences of means, and, fundamentally, because of the law of diminishing utility. Effects of varying the commodities supplied. Possible exceptions to the general principle, 117 — Sec. 3. Total utility and marginal utility, 120 — Sec. 4. Value depends on marginal utility. Qualifications and explanations. Marginal vendibility. The marginal utility of money, 122 — Sec. 5. Consumer's surplus. Sundry limitations on its significance and on the possibility of measuring it, 124 — Sec. 6. How state and measure the income of a community? 129 — Sec. 7. The law of diminishing utility points to the conclusion that inequality lessens maximum well-being, 132.

CHAPTER 10

VOL. I
PAGES

MARKET VALUE. DEMAND AND SUPPLY	134-155
---	---------

Section 1. The conditions of demand and the demand curve, 134 — Sec. 2. Demand possibly discontinuous, usually continuous. Elastic and inelastic demand, 136 — Sec. 3. How value is determined by marginal vendibility, for a fixed supply. The equation of demand and supply, 140 — Sec. 4. A varying supply: the equilibrium of demand and supply, 142 — Sec. 5. How far the supposition of a fixed supply, how far that of a varying supply, conforms to the facts. The circumstances that act on daily and on seasonal prices, 144 — Sec. 6. Qualifications as to the market value of capital goods, 148 — Sec. 7. Retail prices seem to follow wholesale prices, but in the end govern wholesale prices. The advantage of fixed retail prices, 150 — Sec. 8. Current market prices are what people commonly mean when they speak of "fair" prices, 153 — Sec. 9. Sporadic cases where value is affected by utility to sellers, 153.

CHAPTER 11

SPECULATION	156-166
-----------------------	---------

Section 1. The fundamental effect of speculation is to mitigate fluctuations, 156 — Sec. 2. Dealing in futures lessens price fluctuations, 158 — Sec. 3. Exchanges; standardizing, 160 — Sec. 4. The evils of speculation: gambling; unproductive labor, 162 — Sec. 5. The evils of stock exchange speculation, 164.

CHAPTER 12

VALUE UNDER CONSTANT COST	167-176
-------------------------------------	---------

Section 1. The simplest case first assumed: a supply absolutely flexible, free competition, constant cost. Value then determined by cost, 167 — Sec. 2. Illustration by diagram, 170 — Sec. 3. The proposition points to a tendency or approximation only; to what happens in a "static," not in a "dynamic," state, 171 — Sec. 4. Some explanations and qualifications. Flexibility in supply never perfect, often much impeded. Changes in demand from fashion. How far free competition holds. Good will. A small surplus above cost price may mean large profits, 173.

CHAPTER 13

VALUE AND VARYING COSTS. DIMINISHING RETURNS	177-185
--	---------

Section 1. The equilibrium of [value where] marginal vendibility and marginal cost balance. The simile of the scissors, 177 — Sec. 2. Permanent variations in cost affect long-run value differently

CONTENTS

from temporary variations, 180 — Sec. 3. Diminishing returns, 182 — Sec. 4. Permanent variations, or diminishing returns, appear most in the extractive industries, 183.

CHAPTER 14

VALUE AND INCREASING RETURNS 186-194

Section 1. The equilibrium of supply and demand under increasing returns. How the case differs from that of diminishing returns. Long-run results considered, 186 — Sec. 2. What industries show increasing returns. Causes of the tendency. External economics. Localization of industry; labor supply, 188 — Sec. 3. Internal economies, if continuing indefinitely, lead to monopoly, 190 — Sec. 4. Possibility of several points of equilibrium. Increasing returns commonly come slowly, but sometimes fast, 191.

CHAPTER 15

MONOPOLY VALUE 195-213

Section 1. Monopoly affects price thru limitation of supply. This proposition qualified as to transactions between middlemen, especially as to producer's capital, 195 — Sec. 2. How price is fixed if a monopolist has a fortuitous supply; how, if he produces his supply at constant cost. Monopoly profit. Destruction of part of the supply possible, but not probable. Diamond mining as illustrating monopoly price, 198 — Sec. 3. Monopoly price under increasing returns. Copyrighted books as illustrations. Monopoly price under diminishing returns, 201 — Sec. 4. Possibility of varying prices under monopoly; usually disguised. Copyrighted books; telephone rates. Converse case of uniform prices under monopoly, 204 — Sec. 5. "Dumping" explained by monopoly, 207 — Sec. 6. Unqualified monopoly rare; various limitations and qualifications, 208 — Sec. 7. "Corners" (of a season's supply) do not *per se* affect price to consumers, but affect dealers and speculators. Some among the consumers may be affected by corners. Successful corners rare, 210.

CHAPTER 16

JOINT COST AND JOINT DEMAND 214-220

Section 1. Joint cost: effect of increase or decrease in demand. Influence of separable items of expense. "By-products." Complex case where both monopoly and joint cost exist. Influence of large plant, 214 — Sec. 2. Joint demand. The constituent most limited in supply feels most the effect of an increase of demand. Labor in building trades as an illustration. Joint demand usually causes peculiarities less enduring than those arising from joint cost, 218.

REFERENCES ON Book II 220

BOOK III

MONEY AND THE MECHANISM OF EXCHANGE

CHAPTER 17

VOL. I
PAGES

THE PRECIOUS METALS. COINAGE	223-231
--	---------

Section 1. The precious metals the main constituents of the circulating medium, 223 — Sec. 2. Qualities that have caused them to be selected for monetary use: luster, freedom from deterioration, limited supply. Their value and monetary use now rest largely on convention, 224 — Sec. 3. Coinage a public function. Free coinage; bullion and coin interchangeable. The mint price of gold, 226 — Sec. 4. Plentifulness of money is in itself a matter of indifference, 229.

CHAPTER 18

THE QUANTITY OF MONEY AND PRICES	232-248
--	---------

Section 1. The value of money is inverse to its quantity, 232 — Sec. 2. Qualifications of this principle. Flow, or rapidity of circulation, of money and goods, 235 — Sec. 3. Diversion of precious metals from monetary use thru consumption in the arts. Effects of rise and fall in prices; changes in industrial demand. Tendency to sharper separation of monetary and industrial use, 239 — Sec. 4. Diversion of specie from the monetary supply of Western countries by its flow to the East, 242 — Sec. 5. An increase in the supply of money does not ordinarily affect people's ways of using it, but may do so when barter is in process of being superseded by money exchange as was the case in the sixteenth century, 244 — Sec. 6. The conclusions of this chapter, tho simple and provisional, hold good in essentials for more complicated conditions, 247.

CHAPTER 19

THE COST OF SPECIE IN RELATION TO ITS VALUE	249-260
---	---------

Section 1. The determination of the value of the precious metals by their marginal cost is impeded by (1) their durability; (2) their irregular and aleatory production; (3) the unexpected occurrence of new sources of supply, 249 — Sec. 2. Illustrations from history. The American specie of the sixteenth century, and the price revolution of 1550-1650, 252 — Sec. 3. The Australian and California gold discoveries of 1850, and their comparatively slight effect on prices, 255 — Sec. 4. The increase of gold supply since 1890, and its effect on prices, 257 — Sec. 5. For considerable periods, the value of gold determines what shall be the marginal source of supply; it is not the marginal source of supply which determines its value, 259.

CONTENTS

xvii

CHAPTER 20

BIMETALLISM 261-269

Section 1. Both metals long used side by side. The fully developed double standard illustrated, 261 — Sec. 2. Mint ratio and market ratio; overvalued and undervalued metal. Tendency of the overvalued metal to displace the undervalued, illustrated by the experience of the United States, 262 — Sec. 3. "Gresham's Law," 265 — Sec. 4. Subsidiary coin and its proper regulation, 267.

CHAPTER 21

BIMETALLISM, *continued*. THE DISPLACEMENT OF SILVER 270-284

Section 1. The double standard in France, and elsewhere, until recent times. Its tendency to keep the relative value of gold and silver stable. This effect produced by French bimetallism, 1825-73, 270 — Sec. 2. New situation after 1870. Free coinage of silver ceased in 1873. Thereafter, gold the standard in France and the Latin Union, 273 — Sec. 3. The United States; acts of 1873, 1878, 1890, and 1893. Silver dollars and silver certificates, 276 — Sec. 4. Cessation of free coinage in British India in 1893. Decline in the price of silver, 278 — Sec. 5. Would universal bimetallism conduce to a stable ratio between gold and silver? 281 — Sec. 6. Would universal bimetallism conduce to stable prices? 283.

CHAPTER 22

CHANGES IN PRICES 285-303

Section 1. Changes in prices measured by index numbers. The simple arithmetical mean. Illustration from prices in the United States, 1913-18, 285 — Sec. 2. Weighted index numbers. Medians. Illustration from prices in the United States, 1890-1906, 288 — Sec. 3. Effects of changes in prices on creditors and debtors, 293 — Sec. 4. Peculiar problem where the movement of prices is different from that of money incomes, 294 — Sec. 5. Rising prices seem to cause prosperity, falling prices adversity. This is due to the slower advance of money wages, and the consequent gains or losses of employers of labor, 297 — Sec. 6. Change in prices are accompanied by changes in the rate of interest. The parallel movement due, not to any conscious adjustment, but in part to the effects on business profits, in part to the general causes of oscillations in prices, 301.

CHAPTER 23

GOVERNMENT PAPER MONEY 304-324

Section 1. Inconvertible paper, or *fiat* money, dependent on an established habit of using paper money. Its value depends on its

VOL. I
PAGES

quantity, provided it circulates freely. Possible failure to circulate freely; possible collapse from extreme overissue, 304 — Sec. 2. Paper drives out specie. Depreciation from overissue. The specie premium does not measure real depreciation with accuracy. Prospect of redemption affects specie premium, 308 — Sec. 3. Illustration from United States experience in 1862-79, 312 — Sec. 4. Overissue rarely avoided. On what terms resumption of specie payments should be undertaken after a period of depreciation, 314 — Sec. 5. Convertible government paper. United States certificates of deposit. United States notes, or greenbacks, 317 — Sec. 6. Unexampled resort to paper money by European countries during the war of 1914-18. Great rise of prices in the United States also, notwithstanding adherence to the gold standard, 319.

CHAPTER 24

BANKING AND THE MEDIUM OF EXCHANGE 325-341

Section 1. Two functions of banks: in relation to investment and to the circulating medium. The investment operations, 325 — Sec. 2. Bank notes, payable on demand. The safer they are, the less likely to be presented for payment. They tend to displace specie. Effect of prohibition on small denominations, 327 — Sec. 3. Deposits may arise thru cash placed in a banker's custody; but may be created. The mode of creating and maintaining deposits, in connection with loans. The check is the deposit in act of use, 330 — Sec. 4. The offsetting of checks, chiefly thru clearing houses. Great development of clearing houses, 334 — Sec. 5. Deposits as a circulating medium, 337 — Sec. 6. Effects of deposit banking on the circulation of money; on that of bank notes, 338.

CHAPTER 25

BANKING OPERATIONS 342-353

Section 1. Cash in bank's vaults tends to be reduced to the minimum. The other resources should be of a liquid sort. Discount of commercial paper, loans on collateral securities, "outside paper." Growing tendency to combine these operations with investment operations, 342 — Sec. 2. Relation of the rate of discount (interest) to the quantity of cash held by banks. Greater fluctuations on demand loans; their connection with speculation, 346 — Sec. 3. Qualities of a successful banker; importance of good will for the profits of banking, 350 — Sec. 4. Banks do not create capital, but affect the direction in which investment shall be made, and exercise a selective influence among business men. Their social utility stands and falls with the utility of the system of private property, 351.

CONTENTS

xix

CHAPTER 26

CENTRALIZED BANKING SYSTEMS

354-370

VOL. I
PAGES

Section 1. Need of regulating issue of bank notes. Centralization of issue in Europe, 354 — Sec. 2. The Bank of France the simplest case. Its semi-private organization; monopoly of note issue; great stock of specie; advantages and disadvantages, 355 — Sec. 3. The Bank of England under the act of 1844. Issue and Banking departments. Relation to other banks of deposit; large cash holdings. Procedure in times of crises, 359 — Sec. 4. The Reichsbank of Germany. Conditions of note issue. Relation to other banks, 364 — Sec. 5. During 1914-19 all three banks were made to serve war purposes. Gold driven out of circulation in all three countries, 367 — Sec. 6. Increased use of paper money for small transactions, 369.

CHAPTER 27

THE BANKING SYSTEM OF THE UNITED STATES

371-387

Section 1. The old national bank system; note issue secured by bonds, 371 — Sec. 2. Regulation of deposits; requirements as to reserves under the old system. Its merits and defects, 373 — Sec. 3. The Federal Reserve system. The Federal Reserve Board and the Federal Reserve Banks, 375 — Sec. 4. The new system of note issue; the large powers of the Federal Reserve Board, 377 — Sec. 5. The reserve requirements: a consolidated strong reserve sought, 379 — Sec. 6. The operations of the system during the war years 1914-18; rapid attainment of a position of command, 381 — Sec. 7. Should special protection be given holders of bank notes? 383.

CHAPTER 28

CRISES

388-400

Section 1. Two phases of crises: industrial depression and financial collapse. Periodicity of crises exaggerated, but regularity of recurrence unmistakable. General features, 388 — Sec. 2. Industrial depression due to maladjustment in the division of labor, and especially in the making of new capital. Railways: iron and steel production, 391 — Sec. 3. The psychological factor; the contagion of business optimism and depression. The part played by merchants and retail dealers, 393 — Sec. 4. During the period of depression, the machinery of production and exchange is out of gear. The cause and sequence of revival, 394 — Sec. 5. Maladjustment in investment; making of new capital beyond the limits set by available savings. Influence of corporate securities, 397.

CHAPTER 29

FINANCIAL PANICS

401-414

Section 1. Panics as to business men. Interlacing debts and credits, and possibility of general collapse. Demand for ac-

commodation in times of crises, 401 — Sec. 2. Position of the banks: demands for loans and for cash. Need of a bold policy. Aid which a central bank can give, 402 — Sec. 3. Peculiar dangers in the United States, from the wide diffusion of deposit banking. Clearing-house action when an individual bank is threatened. Difficulties when all the banks are threatened, 405 — Sec. 4. Former devices for dealing with panics, thru combined action and clearing-house certificates, inadequate in the United States. Severity of the panics of 1873, 1893, 1907. The Federal Reserve system designed as a remedy, 407 — Sec. 5. Industrial evils of crises hard to remedy. In the main, inevitable concomitants of private industry, 411.

CHAPTER 30

THE THEORY OF PRICES ONCE MORE 415-433

Section 1. Credit ordinarily does not supplant money, but postpones its use. For short periods, extension of credit may influence prices, 415 — Sec. 2. Credit in the form of negotiable paper, especially bank notes, may be a complete substitute for money. Credit thru offsetting of transactions completely supplants money. The clearing house does this on a great scale, 416 — Sec. 3. Prices depend on purchasing power in terms of money — not only specie, but paper money, credit, bank notes, deposits. Peculiar problem as to bank money, especially deposits: interdependence of the volume of purchasing power and the volume of transactions, 419 — Sec. 4. How the volume of deposits depends on the quantity of specie; from (a) direct necessity, (b) binding custom, (c) legal requirement, 421 — Sec. 5. (d) Interaction of deposits, notes, specie, 424 — Sec. 6. (e) The temper of the business community, 427 — Sec. 7. Influence of foreign trade. Prices in credit-using and deposit-using countries affected by prices in other countries, 429 — Sec. 8. Illustration of the preceding principles, from analysis of the way in which an increase of gold supply affects prices, 430 — Sec. 9. In what sense the term "money" is best used, 432.

CHAPTER 31

PROPOSALS FOR MONETARY REFORM 434-441

Section 1. The multiple standard impracticable, 434 — Sec. 2. The plan of alternate contraction and expansion as prices rise and fall. Improbability of the needed persistence, 436 — Sec. 3. The stabilized dollar; similar difficulties, 437 — Sec. 4. The simple gold standard supplies the best available system, 440.

REFERENCES ON BOOK III 442-443

CONTENTS

BOOK IV

INTERNATIONAL TRADE

CHAPTER 32

VOL. I
PAGES

THE FOREIGN EXCHANGES

447-466

Section 1. The "foreign exchanges," based on the varying coinage systems of the different countries. How bills of exchange settle payments without the movement of specie, 447 — Sec. 2. The par of exchange, and premium and discount of exchange; illustrated by sterling exchange in New York, 449 — Sec. 3. Bankers as middlemen in foreign exchange. Fluctuations in rates, due to the higgling of the market, 451 — Sec. 4. Dealings between a series of countries illustrated by transactions between the United States, England, and Brazil. The wide use of sterling bills for trade between all parts of the world, 454 — Sec. 5. In what manner prices are influenced: in the long run, by the flow of specie; for shorter periods, by the rates of discount. Various complicating factors, 457 — Sec. 6. Foreign exchange between gold-standard and silver-standard countries. The case of British India until 1893, 461 — Sec. 7. Foreign exchange when there is depreciated paper. Dislocated exchanges and their disturbing effects. Relation between imports and exports, general prices, and specie premium, 462.

CHAPTER 33

THE BALANCE OF INTERNATIONAL PAYMENTS 467-478

Section 1. Other items than merchandise exports and imports. Lending and borrowing and their effects on imports and exports. International dealings in securities, 467 — Sec. 2. Expenses of travelers and non-residents. Remittances from the United States by immigrants. Freight charges, 471 — Sec. 3. Position of a country that mines specie, 473 — Sec. 4. Illustration from the international trade of the United States, 1790-1908, 474 — Sec. 5. The notion of a favorable and unfavorable balance of trade. Usual attitude of the business community. In the main, an excess of imports or of exports is no indication of loss or gain; least of all, in the trade between one country and any other country, 475.

CHAPTER 34

THE THEORY OF INTERNATIONAL TRADE. WHY PARTICULAR GOODS ARE EXPORTED OR IMPORTED 479-492

Section 1. Some familiar facts: money incomes and prices differ in different countries; but prices of goods entering into international trade tend to be the same. Money wages not necessarily low in

exporting countries, 479 — Sec. 2. A country exports those things in which its labor is relatively effective — in which it has a comparative advantage. Illustrations from countries of high wages and of low wages, 481 — Sec. 3. Specially low wages of a particular class of laborers operate as a comparative advantage. General low wages do not affect international trade or enable universal underselling, 484 — Sec. 4. A country may import things for which its labor is productive, if its labor is even more productive for other things. But international trade rests largely on absolute differences, 487 — Sec. 5. The gain from differences in comparative cost is dependent on immobility of labor between countries, 489 — Sec. 6. A country may import part of the supply of a given commodity, produce a part at home. Difference between extractive and manufacturing industries in this regard, 490.

CHAPTER 35

THE THEORY OF INTERNATIONAL TRADE, *continued*. WHEREIN THE GAIN CONSISTS 498-506

Section 1. Difference between exchange within a country and international exchange. Varying rates of wages in different countries show varying gain from the exchanges between them, 493 — Sec. 2. An illustrative case, England and Italy. Demand and utility determine relative wages and prices. Slow and obscured operation of this cause, thru the influence of the specie supply on prices, 494 — Sec. 3. Effects of changes in international demand; of new articles of export; of payments other than for merchandise, 497 — Sec. 4. Difficulty of following these causes in detail, illustrated by the case of the United States since 1873, 498 — Sec. 5. Money incomes, not prices, important in determining the gain from international trade, 500 — Sec. 6. Two causes act on the gain: the play of international demand and the effectiveness of labor in producing exported goods. The last cause settles the general rate of money wages, 502 — Sec. 7. High money wages and other incomes do not necessarily bring high domestic prices. Illustration from the United States, 503.

CHAPTER 36

PROTECTION AND FREE TRADE. THE CASE FOR FREE TRADE 507-522

Section 1. The main argument for free trade is simple. Persistence of mercantilist notions, 507 — Sec. 2. Some popular arguments for protection: creating a home market; the truck farm case; creating employment, 509 — Sec. 3. The effect of protection on wages. General wages lowered, tho some particular wages possibly kept up, 512 — Sec. 4. The principle of equalizing cost of produc-

CONTENTS

xxiii

VOL. I
PAGES

tion, 515 — Sec. 5. Effects of duties on prices and on consumers. A national loss only if domestic products are substituted for those imported. Monopoly may bring special gain to domestic capitalists, but brings no national loss. Labor monopoly may bring special gains to particular laborers, 517.

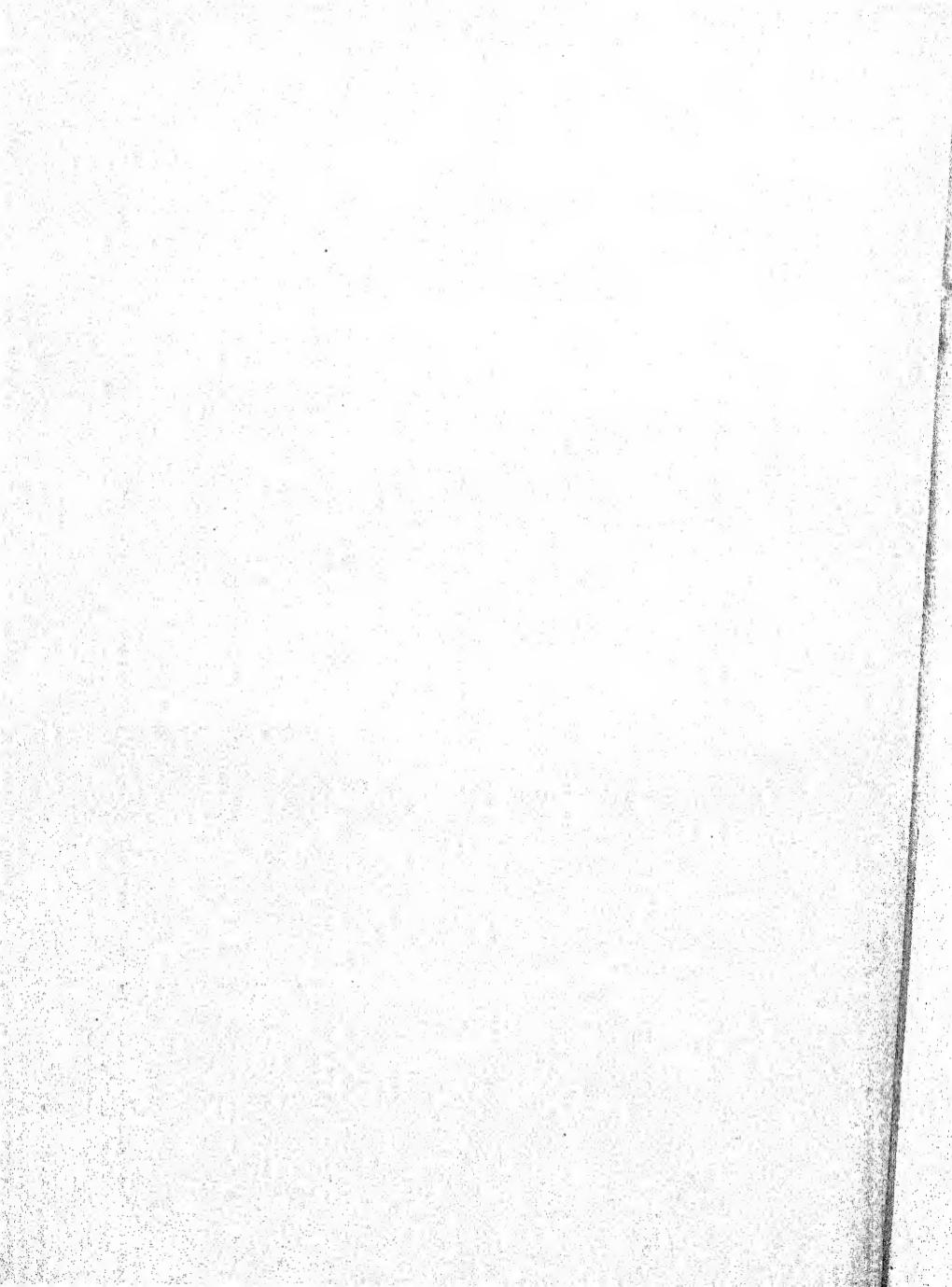
CHAPTER 37

PROTECTION AND FREE TRADE, *continued*. SOME ARGUMENTS FOR PROTECTION

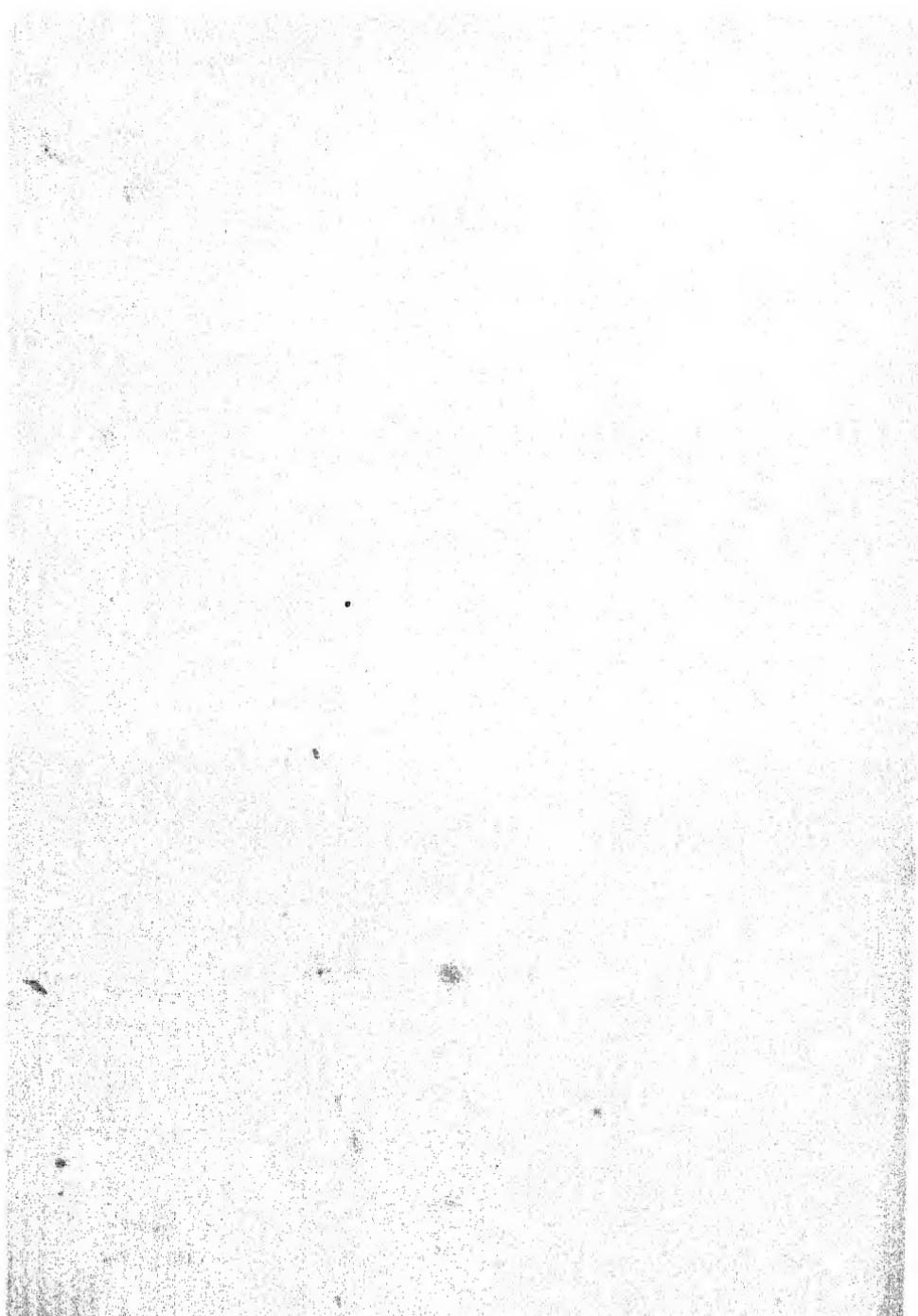
523-544

Section 1. Protective duties, by their effects on general money incomes, may bring more advantageous terms of international exchange, 523 — Sec. 2. Protection to young industries. Applicable in the main to manufactures only. Difficulty of gauging its success in specific cases, 526 — Sec. 3. Political considerations illustrated by the case of shipping subsidies, 529 — Sec. 4. Social considerations may tell against manufactures, but not necessarily so. The controversy in Germany; Agrarstaat *vs.* Industriestaat. The argument as to the failure of food supplies, 532 — Sec. 5. Peculiar dependence of England on international trade and on exports. Possibility of strengthening her position as exporter by agreements with colonists and by threats of retaliation, 535 — Sec. 6. Growth of protection during the last fifty years, 537 — Sec. 7. Economic effects of protection in the United States; impossible to measure accurately, but certainly exaggerated in popular discussion, 538 — Sec. 8. Conditions under which manufactures would maintain themselves without protection. Effect of machinery in connection with comparative costs, 540 — Sec. 9. Concluding remarks on the working of protection in the United States, 543.

REFERENCES ON Book IV 544-545



BOOK I
THE ORGANIZATION OF PRODUCTION



CHAPTER 1

WEALTH AND LABOR

Section 1. The subject matter of economics, 3 — Sec. 2. Wealth; free goods; economic goods. Wealth and welfare, 5 — Sec. 3. Goods may become economic thru mere scarcity; but commonly do so because of the exertion of labor, 7 — Sec. 4. Activity may be irksome or pleasurable. Labor usually is continuous, monotonous, irksome, 8 — Sec. 5. Some sorts of labor always pleasurable, 10 — Sec. 6. The irksomeness of most labor to be lessened by better general opinion, and by greater leisure thru shorter hours, 12.

§ 1. To define with accuracy the scope and contents of economics is not of importance in the earlier stages of its study. The precise demarcation of its subject matter, and its relation to other branches of knowledge, can be understood only when something is known of its main conclusions. It suffices at the outset to indicate by an example what is the nature of the problems dealt with. A good example is found in the economic position of one of the most familiar articles of use — water.

In a thinly settled community, where springs and streams are abundant, water is free to all. No question can arise as to its ownership or as to the mode in which the community should deal with it. Every one is fortunate in having an unlimited supply. No one can gain advantage by taking possession of part of it, or devoting labor to procuring it.

Water under such conditions is said to be a "free" good, not an "economic" good. It is not an economic good, in the sense that no economic problems arise regarding it. Every one has all he wants, and thereby is prospered; what more is there to say?

A stage may come very early when some labor will be given to making the water conveniently available, and when it will be no longer strictly a free good; and when yet no economic questions of any complexity arise. The individual may dig

a well, or pipe the water from a spring or stream to his dwelling. The very first economic problem, that which may even be considered the fundamental problem, then emerges: How much effort is it worth while to give to the supply of this convenience? But the problem remains a very simple one, so long as the individual exerts himself to satisfy his own wants only. There is no dealing with others, no sale, no question of price. If men were to work solely for the satisfaction of their own wants the difficult economic questions would not arise at all.

A more complex stage is reached when water is brought in by some individuals and sold to others. In oriental towns the water carrier, with his runlet or skin, is still a familiar figure. In our own cities private individuals sometimes sell carboys of spring water or distilled water. Here questions of sale and price arise. What settles the terms on which water is sold? What settles the earnings of those who supply it? Are they in a position of advantage or not? Here are matters less simple.

Still another stage (not necessarily a later stage) is reached when common action is taken to procure the water. Here the problem may remain comparatively simple, or it may become one of the troublesome problems of modern communities. The traveler in Italy sees the village fountain, supplied by its aqueduct; even in larger towns, through some parts of Europe, the public fountain has remained until very recently the chief source of supply. The water is no longer strictly a "free" good, since effort and expense were required to bring it where wanted. But the effort was made long ago, does not need to be renewed (there are no expenses of upkeep), and there is so much water that it can be used without restriction or regulation. In the modern city, however, the case has become different. There are great reservoirs, elaborate pumping stations, mains and pipes. Water is supplied abundantly and conveniently to every household. There is not only a vast initial outlay for the plant, but a continuing cost of upkeep. The questions arise, Who shall make the outlay and manage the supply? Shall there be public or private ownership? And, whether under public or private owner-

ship, what are to be the conditions of sale? Conceivably the water, if under public management, may still be supplied gratuitously to all, as it is at the village fountain; or payment may be required of the users. The questions of profit arise, of sound public policy, of possible monopoly gains, of conflict between financial and hygienic considerations. The really complex problems of economics arise full-fledged.

§ 2. To designate these different sorts of conditions, some quasi-technical terms are often used: "free goods," "economic goods," "public goods," "wealth."

What are free goods and what are economic goods has just been indicated. Fresh air, climate, sunshine, are the obvious cases of free goods; so is water under the simplest conditions, or standing timber in a thinly settled and well-wooded country.

Scarcity is the earmark of an economic good — scarcity, that is, relatively to the demand. Water becomes an economic good when effort is needed to obtain it in the quantity desired, at the place of use. Conceivably fresh air will become in the future, for considerable numbers of mankind, an economic good. It is so already when many persons are gathered in a large room or hall. Fans, conduits, engines, are installed; it becomes a question how the needful efforts shall be best directed, who shall bear the expense. With the concentration of population in great cities, and the multiplication of agencies that pollute the air in them, it is possible that elaborate means will have to be taken for keeping it healthful. Then the same complex problems will present themselves as in the case of water; all resting on the relative scarcity of the thing in question.

"Public goods" are economic goods supplied gratuitously to individuals, yet involving effort and consequent expense to some one. They are not free to the users, they are not free goods. Such is water at the public fountain; such are public education, parks, museums, free concerts, bridges, and highways. What goods shall be public, and by whom the expense of providing them shall be met — whether by levy on all persons, or on some only — these are problems as to public functions and as to taxation

for defraying their expense; among the most difficult and far-reaching that the economist has to deal with.

It was common in the older books on our subject to define political economy (a phrase replaced in modern times by the simpler "economics") as the "science of wealth." In this usage, "wealth" meant all the economic goods, including the public goods. Either term — wealth or economic goods — serves to describe the subject matter with which economics has to deal; those things which men want, which are not free, and which present the problems of effort, of satisfaction thru effort, of the organization of industry.

Evidently a community is the better off, the more free goods it has and the less the range of things that come within the category of "wealth." Where unlimited pure water and fresh air are at every one's disposal, the conditions of life are eased by so much. A mild and equable climate relieves the people of some favored spots from much labor that must be given elsewhere to protection from heat or cold. It may be said, with an appearance of paradox, that the more things in the nature of wealth a community has, the less prosperous it is. The paradox is easily solved. The wealth of a community is not the sum total of things on which its welfare depends — these include its free goods as well as its economic goods. The more things are free, the easier are the conditions of living. The more things are economic, the wider is the range of commodities concerning which the economic problems arise, and the wider is the scope of the science of "wealth."

The abundance of free goods, tho in itself advantageous to a community, does not always coexist with the highest degree of prosperity. In tropical and semitropical countries the conditions of living are on the whole easier than in temperate countries. Some sorts of food are free or nearly free, and protection does not need to be provided against the cold of winter. But the climate saps energy, and checks the development of physical vigor and of intellectual capacity. Hence the peoples of temperate regions, from the very obstacles they have to overcome, gain resources within themselves which lead eventually to greater

prosperity. So it is with individuals. He who has always had abundant means at his command often lacks endurance and spirit, and in the end is surpassed in happiness as well as in riches by him who had to face harder conditions at the start.

§ 3. In the preceding paragraph wealth has been spoken of as the result of effort. But there are cases where a commodity is wealth — is an economic good — even tho it be obtained without effort. A free gift of nature may be wealth, if it is limited in quantity.

Meteoric stones, usually disintegrated by heat before touching the earth's surface, in some instances reach the ground. Being scarce, and in our days esteemed for scientific research or even for the satisfaction of mere curiosity, they command a price, and, tho the free gift of nature, are not free goods in the economic sense. On some parts of the seashore the waves dislodge from near-lying rocks quantities of kelp, which is useful as a fertilizer. Like multitudes of other articles, its use is indirect; it does not satisfy wants directly, but is an aid in the operations for satisfying them. Obviously, it may none the less be wealth. If kelp were steadily borne to the shore in such quantities that every one could get all he wished, it would be a free good in the strict economic sense. But if it is deposited in limited quantities on favored spots, and if many farmers are desirous of using it, it will command a price as it lies on the beach, before the hand of man has touched it. And the same quantity which at one time was so abundant as to command no price, may be brought by the growth of population within the circle of things bought and sold, and so become one of the goods with which economic science deals.

The same narrowing of the circle of free goods, and the same widening of that of economic goods or wealth, appear if there be not a natural, but an artificial, scarcity of goods. A supply of water or timber, unlimited in quantity for the needs of a given community, may come by force or by long-settled law under the control of some individual or individuals. By limiting the amount which others shall have, the owners may make such

things a source of income for themselves and cause them to enter the list of economic goods. Monopoly by itself raises some of the questions with which economic science has to deal.

This simplest sort of scarcity may seem to be exceptional; and as to the things which we usually think of as goods or commodities, it is so. The instances just adduced are exceptional. In the vast majority of cases commodities become economic after some labor has been applied to fashioning them. The scarcity (that is, relative scarcity) still underlies the notion of wealth or economic goods, it is scarcity in the sense that the materials supplied by nature need to be adapted to man's use by his labor. Labor, or effort of some sort, is usually the cause or condition underlying economic phenomena.

There is one large class of things, however, for which this statement does not hold: limited natural agents, of which land is the most conspicuous. These are not commonly called goods or wares; but they are economic goods in the strict sense, being limited in quantity and of high service in satisfying wants. Agricultural land, power and deep-water sites, forests, mineral lands, — all are often economic goods by virtue of mere natural limitation of quantity. They present, as will appear in due course, some of the most intricate social and economic problems.

§ 4. What constitutes labor, may seem a simple matter. Most people would say that they are more than sufficiently familiar with it. Yet some questions arise concerning it that go to the heart of economics, and the last word on them cannot be said until the very close of the exposition of the whole subject.

Some activities are agreeable, some are irksome. Some are undertaken for the pleasure of doing, some for a reward. Not infrequently the two satisfactions are gained simultaneously from the selfsame activity; it is both a source of pleasure in itself, and it brings a reward.

So far as the nature of the muscular or nervous effort is concerned, no distinction can be drawn between the agreeable and the irksome activities, or between those which are undertaken for pleasure and those which are undertaken for pay. Such

severe physical labor, combined with hardship and exposure, as mountain climbing, is done for pleasure by tourists and for pay by guides. The pursuit of athletic sports is the most familiar of recreations and is also a familiar profession. A multitude of occupations ordinarily pursued for gain — woodworking, gardening, painting, acting — are also pursued by many persons for the satisfaction which the doing affords.

None the less it is true that the greatest part of the activity which men carry on in getting a living does not give pleasure. The chief reason seems to be that activity, in order to be effective toward getting a living, must be steady, unvaried, and long-continued; and it must be, in an important sense, not free. The characteristic of most activities that are sources of pleasure in themselves is the element of freshness or novelty, and the absence of any sort of compulsion. The guide who climbs mountains year after year, and knows the tracks by heart, soon finds the task a weary one; and this the more, because in order to earn his living he must follow his tracks regularly, regardless of his health or spirits at the moment. It is the zest of novelty and the sense of freedom and choice that cause pleasure in the summer's strenuous vacation. Inactivity and idleness soon become irksome; but, with few exceptions, steady application to the same task also soon becomes irksome.

In savage and barbarian communities, the men usually confine themselves to the chase and to war. The monotonous work of cultivating fields and of preparing food is left to the women. Though hunting and fishing often entail the severest hardship, they do not commonly endure long, and they are almost surely varied by changes and respites. The variety and the sudden changes give play for emulation and for satisfying the love of distinction, — that for slaughter also; instincts which have a powerful effect in many fields of economic activity. An alternation of periods of complete idleness and of feverish activity is characteristic of those early stages of society in which men give themselves to the unchecked satisfaction of their instinctive propensities.

The sort of labor that occupies the mass of mankind in civ-

ilized societies, and that which brings the largest product, is mainly of the continuous, monotonous, and irksome kind. This is more especially the case where the division of labor has been much elaborated. The wide extension of the division of labor, as we shall presently see, has been a main cause in modern times of the greater abundance of material goods, and of the extraordinary advance in material prosperity. But it has probably also been a cause of greater weariness and unattractiveness for most labor. Even in the simpler and older form of the division of labor, where one man was carpenter, another smith, another cobbler, there was of necessity a steady repetition of operations and no little monotony of work. But in the remarkable splitting up of occupations which has resulted from the elaboration of machinery in modern times, it is rare that a workman does all the work of his trade, or even knows how to do it. He is no longer a cobbler making a whole shoe, but a factory hand attending hour after hour and week after week to the same minute piece of machine work. Moreover, in a dense population and with strictly enforced ownership of property and of land, he is under compulsion to do continuous work of some such sort, in order to keep body and soul together. He lacks variety, and he lacks freedom. He may find pleasure in exerting himself strenuously at sports; but the labor of getting his living yields in itself little satisfaction.

§ 5. Some sorts of labor, tho pursued systematically and continuously, seem never to become wearisome. This is the case with much intellectual labor, especially that of persons who are engaged in the pursuit of knowledge and in the satisfaction of man's insatiable curiosity about the things that surround him.

Persons of artistic temperament — painters, musicians, poets — have often so strong an instinctive bent toward one kind of activity that nothing can hold them from it and nothing ever pall the pleasure of the exertion. And any occupation which satisfies the instinct of emulation has unceasing charm. He who can achieve things which few can achieve, and which many would like to achieve, rarely tires of his work. The actor, even tho his occupation involves the monotonous and long-continued

repetition of the most trifling details, never fails to get a thrill of pleasure from the breathless silence or stirring applause of his audience. Were he compelled to go thru his part as often and as rigorously under the cold supervision of an indifferent supervisor, and under that only, how flat and stale it would become! For a similar reason, work of leadership and command almost always is continuously pleasurable. It satisfies the love of distinction and the desire for domination; and it has a real or apparent element of freedom. Hence the work of the employer commonly affords more satisfaction than that of the employee, and often is continued, from mere love of the doing as well as from habit, long after the reward or profit from the exertion has ceased to be valued.

These exceptions should not blind us to the fact that by far the greater part of the world's work is not felt to be pleasurable. Some reformers have hoped to reach a social system under which all work would be in itself a source of satisfaction. It is probable that such persons are made optimistic by the nature of their own doings. They are writers, schemers, reformers; they are usually of strongly altruistic character, and the performance of any duty or set task brings to them the approval of an exacting conscience; and they believe that all mankind can be brought to labor in their own spirit. The world would be a much happier place if their state of mind could be made universal. But the great mass of men are of a humdrum sort, not born with any marked bent or any loftiness of character. Moreover, most of the world's work for the satisfaction of our primary wants must be monotonous, and often rough and coarse. There must be ditching and delving, sowing and reaping, hammering and sawing, and all the sustained physical exertion which, however lightened by tools and machinery, yet can never be other than labor in the ordinary sense of the term.

Reference has just been made to a greater monotony of labor in modern times, under the influence of growing use of machinery and growing specialization of labor. But the extent of the change in this regard may be easily exaggerated. Ruskin has dwelt on the charm of the medieval craftsman's task, who felt the joy

of work that had beauty and character. Yet this joy was probably shared by few in medieval times or in any other. Then, as now, most work involved the repetition of the same operations, and was felt to be tedious and exacting. It is not easy for us to picture the conditions of life in earlier societies, organized in a very different way from our own; but it is more than probable that the mass of mankind found their tasks on the whole no pleasanter or lighter than than now.

§ 6. We may hope that as the material conditions of mankind improve, especially in the countries of advanced civilization, gains will be achieved as regards the irksomeness of ordinary labor. Some alleviation will come from a mere change in the state of opinion in the community. The sense of distinction affects the satisfaction from exertion. (A task admired is an attractive task, and one despised is unattractive.) The common attitude of the more favored classes has long been to condemn manual labor and those who perform it. Such was the natural attitude in communities based on slavery or on its successor feudalism; and such remains too often the attitude of that leisure class which in modern times apes many of the traits of feudalism. The growing democratization of society may be expected to change this, and to raise the dignity and self-respect of labor of all kinds, manual or mental. Greater ease of movement between different classes and greater equalization of their conditions will add to the esteem in which all kinds of manual labor are held, and may remove some at least of the causes that now contribute to make it unwelcome.

The chief mode, nevertheless, in which labor is likely to be made less irksome is not by a change in its character or its intrinsic attractiveness, but by a diminution in its severity. It will probably be lightened by the increasing perfection of tools and the increasing use of machinery; tho on the other hand, it may be that from this cause its monotony will become no less, perhaps greater. More important is the prospect that the hours of labor are likely to be shortened, and the hours for recreation and variety correspondingly lengthened. The weariness of la-

bor is by no means in proportion to the number of hours spent on it. For a healthy and well-nourished person, the first hours of exertion are not a source of fatigue. Some writers have indeed maintained that during these earlier hours — barring perhaps a brief initial period of stiffness — there is a sense of pleasure rather than of pain. This may be the case in intellectual activity, and in some handicraft occupations; and the experience is a familiar one in holiday jaunts. But little direct consciousness of pleasure comes at any stage from the stated work of the great majority of men. The difference between the earlier parts of their day and the later is not so much that the former are pleasant and the latter unpleasant, as that fatigue does not begin until some hours have passed, and then becomes increasingly severe with each of the later hours. When indeed the hours of labor are unduly prolonged, fatigue becomes so great and so deep-seated that the period of rest and sleep does not suffice to remove it. The next day begins again with fatigue, and worse succeeds worse. Such was the effect of the factory system in its early stages in England; such is still the situation in backward countries like Russia. Under these wretched conditions, the work of the day has covered eleven, twelve, even fourteen, hours. In the United States in our own day, some of the steel-making industries, whose operations go on night and day, have had two shifts, in each of which the men worked twelve hours. In such industries the substitution of three shifts and the reduction of hours in each from twelve to eight bring immense progress toward a life of tolerable happiness.

The movement for shorter hours has been one of the most beneficent aspects of the betterment of material conditions in civilized countries during the last two or three generations. The day's labor was first cut down to eleven and ten, partly by the pressure of workmen's organizations and partly by legislation restricting the hours of women and children employed in factories. It is still in process of being reduced. The ideal of the trade unions is now to lower it to eight hours; a limit which has already been reached in the more prosperous and highly paid

trades, and is likely to be attained by a larger and larger proportion of manual workers. We shall have occasion to consider at a later stage the significance of this shortening of the period of work, the nature and causes of the gains so secured, and some fallacies which have attached themselves to the short-hour movement.¹ But in itself that movement should have the sympathy of every friend of humanity.

Notwithstanding all the alleviations of the irksomeness of labor — thru moderate hours and moderate tasks, free time for recreation, a rational respect for labor of all kinds — the larger part of the world's work will always be felt to be irksome. A fortunate minority may work at tasks which are in themselves pleasurable and are not performed chiefly for the return which they bring. But most work is now undertaken for reward, would not be done without reward, and is strenuous and well directed in proportion to the reward. It is doubtless true that the mass of mankind, tho they find their labor irksome or repellent, are yet happier than they would be under complete idleness, or with only that fitful kind of exertion which attracts the savage. But labor is commonly felt to be a hardship, and the pay which it secures is the dominant motive for undertaking it. The fundamental problems that arise in economics are concerned with the relation between unwelcome exertion and the remuneration which induces that exertion.

¹ See Chapter 58.

CHAPTER 2

OF LABOR IN PRODUCTION

Section 1. Labor given to material objects deemed alone productive by earlier English economists. Objections to this view, 15 — Sec. 2. Labor creates utilities only; all labor that issues in utility is productive. Is there nonmaterial wealth? 17 — Sec. 3. Is there any unproductive labor? Labor given to things harmful, 20 — Sec. 4. Labor of judges and lawyers; of soldiers, 23 — Sec. 5. Predatory labor. "Business." The law and unproductive labor, 25.

§ 1. The relation of labor to production may seem simple. Yet it has been the occasion of great difference of opinion among acute thinkers, and it presents some nice questions.

We commonly speak of a tailor as making clothes, a carpenter as making a table, a cobbler as making boots. The familiar phrase, like most such, is elliptic, and it leads easily to misunderstanding. The labor of the tailor but gives the finishing touch to the work previously done by a long series of persons — the shepherd who tended the flocks, the wool shearer, those who transported the wool by land and sea, the carder and spinner and weaver, not to mention those who made the tools and machinery of these workers. Similarly the carpenter is the last of a succession of persons who worked toward a common end — the lumberman in the woods, the sawyer in the mill, the trainman and the engineer on the railway, and so on. Many laborers, arranged in long series, combine in making even the simplest commodities.

But it is clearly all these laborers, taken together, who produce the commodities; and can it not be said these alone are the producers of wealth? Wealth has been described as consisting of those goods which are not free. The term refers primarily to things that are tangible and material. Many laborers produce no wealth in this sense. Such are domestic servants.

policemen, actors, singers, teachers. Does not their work stand in a different relation to production from that of laborers who make material things and carry on production in the common meaning of the word?

This was the opinion of many of the earlier writers on economics, especially the English writers from Adam Smith to John Stuart Mill. Their view was that only such laborers as turned out material things were productive; all others were unproductive. A liberal interpretation was indeed given to their definition of the productive laborers. Not only those who directly handled materials and fashioned them were included — the day laborer, the carpenter, and the smith; but those also by whom the operations were guided and promoted — the employer who directed the manual laborers, the foreman and the engineer, the teacher who trained the engineer. Even the teacher of the humblest workman may conceivably be regarded as contributing to the operations of material production in so far as the diffusion of even the rudiments of education raises intelligence and adds to efficiency. But with the widest latitude in interpretation, a great range of persons, doing all sorts of work and by it earning a living, remained outside the class of the so-called productive laborers. Domestic servants, lawyers and judges and policemen, all the army and navy, not to mention persons who provided mere amusement, were classed as unproductive. As Adam Smith remarked, "in the same class [of unproductive laborers] must be ranked, some both of the gravest and most important and some of the most frivolous professions: churchmen, lawyers, physicians, men of letters of all kinds; players, buffoons, musicians, opera singers, opera dancers."

This distinction between productive and unproductive laborers was early attacked and long debated. It was pointed out that it seemed to affix some sort of stigma — an accusation of uselessness, of being in need of support from others — on whole classes of persons whose work was admitted to be honorable and often seemed to be indispensable. But this was

after all not material; whether or no an "unproductive" occupation was to be regarded as honorable, the essential question was and is whether there are differences between this kind of work and the other which are important for the welfare of the community. It was much more to the point that the distinction led to difficulties and inconsistencies. The musician was regarded as an unproductive laborer; was the artisan who made his instrument — his violin — nevertheless productive? The labor of the violin-maker issued in material wealth, or, as Adam Smith said, in "a vendible commodity." Yet its only object was to make an instrument to be used by the musician; and was not the consistent view that of regarding the two sets of persons as combining for a common result, just as the sheep shearer, the weaver, and the tailor combine in making clothing? And if thus working together for the same end, was one to be set apart as productive, the other as unproductive? All members of the navy and army were classed as unproductive; yet those who built the ships, made the guns and the powder, were supposed to be productive. If one set were unproductive, why not the other?

§ 2. The solution of these difficulties is indicated by a conception which the British economists, tho they followed it in other directions, were curiously slow to use with reference to their discussion of productive labor. It points to satisfactions, or utilities, as the aim and end of production. We shall see, as we progress, how in various directions economic science gains, and is often brought to unity and consistency, by the analysis of production as ending in utilities.

If it is a misleading use of language to speak of a carpenter as "making" a table; it is also misleading, tho in a different way, to speak even of a group of associated workers as "making" anything at all. The lumberman, the sawyer, the railway crew, the carpenter, between them are impotent to add to the amount of matter in the world. All that man can do is to change forms and combinations. And just this he does. He fashions and refashions material things. He puts them into forms in which they

serve his wants. Such is obviously the nature of the carpenter's work, the tailor's, the cook's. It is not less true of those whom we describe as "producing materials." The plants from which man secures the greatest part of his food and most of the material he uses, get their constituent parts from the soil and the air. What man does is to arrange conditions favorable for their growth. The minerals which he uses are a fixed store in the earth's crust. When we say that coal is produced, we mean that it is brought to the surface and made available for our use.

The modes in which man brings about utilities or satisfactions are many. Not only are plants grown, and coal, iron, copper brought up from the mines; not only are these raw materials shaped and adapted for their different uses — they are also transported to the places, often very distant, where they reach the hands of those whose wants they finally satisfy. They are bought by traders from one set of persons, and sold again to another; and among the traders there is a division of labor, some buying at wholesale and selling again to the retailers, who in turn dispose of the commodities to their customers. The phrase "place utility" has been used to describe the contributions of those engaged in transportation and trade; and it serves to bring into relief the fact that such persons, tho they do not shape or fashion commodities, yet contribute to their utilization.

Now, since the essence of production is that it leads to satisfactions or utilities, it follows that any labor or effort that yields utilities is productive. The musician whose performance brings us pleasure does precisely the same sort of thing as the florist whose blossoms last a few hours. The domestic servant contributes to our ease just as does the artisan who supplies the furniture for our dwellings. No doubt there are gradations in the importance of the wants supplied by different workers. The essentials of life are most important; the conveniences and luxuries come after them; and these gradations, as we shall see, have economic consequences. But they are not significant for our present purpose; they give no ground for distinguishing between those producers who embody utilities in material objects, and those

who do not. If we were called on to dispense with the services of some of the producers, we might put aside, as easily spared first, the buffoons and the opera dancers who figure as unproductive in Adam Smith's list. But we might also put aside at once the scene painters at the opera, the printers of trashy books, the makers of cloying sweets and noxious drinks. And if, on the other hand, we were called on to say what producers we should retain to the last, we should select not only those who supply the material things essential for existence — food, clothing, shelter — but also the physician who preserves our health and the teacher who maintains the education on which civilization rests. The distinction between things essential and things dispensable is by no means the same as that between material and immaterial sources of utilities.

We conclude, then, that all whose labors satisfy wants — all those who bring about satisfactions or utilities — are to be reckoned as taking part in production, and are to be called productive laborers. Certain it is, whatever phraseology we care to apply, that no conclusions of importance for economics flow from the distinction between those who shape material wealth and those who bring about utilities of other kinds. And the test of the value of a distinction or classification is always that significant propositions can be laid down concerning the things put into a given class which do not hold for those outside the class.

This conclusion also enables us to dispose of an allied question: Is there nonmaterial wealth? Those who denied the old proposition — who maintained that labor which did not embody a utility in material objects was nevertheless productive — often maintained that there was such a thing as "nonmaterial" wealth. The phrase certainly is not in accord with common usage. We think ordinarily of wealth as something that can be kept and accumulated, and intend by it tangible things; and in this sense it is a contradiction in terms to speak of nonmaterial wealth. But if we use the more technical and therefore more precise phrase, "economic goods," we include all those things and services which satisfy human wants and are not to be had free.

The services of those whom Adam Smith and his followers called unproductive laborers come under this head. They are desired and prized, often highly prized; and they are yielded by human effort. The rewards earned by these efforts are an important topic in economic science, and the utilities provided are an important part of the sum of utilities which constitute, in the last analysis, the community's income. If we mean by wealth anything about which economic problems arise, we must make the terms coextensive with the term "economic goods"; and then we may speak of nonmaterial wealth.

§ 3. From this interpretation of the terms, it would seem to follow that all labor belongs to the productive class. If not only the butcher and the baker are in this class, but the barber and the fiddler, do any remain who are to be regarded as unproductive?

Obviously, there are some persons who are outside the pale of productive activity. The paupers, thieves, swindlers, ne'er-do-wells, are parasites. Thieves and swindlers often exert themselves severely, tho not often continuously. But their activity is purely predatory. They contribute nothing; they simply try to get things away from others. Whether or no we should apply the term "labor" to their exertions, it is certainly not to be called productive labor.

A different question arises as to some labor carried on without violation of the law and without conscious delinquency, yet certainly of doubtful aspect. A quack medicine, containing ingredients which the maker knows to be noxious, or at best harmless, may be puffed by mendacious advertising into widespread use. Can it be said that the labor devoted to preparing it and persistently circulating lies about it is productive of satisfactions, and therefore to be reckoned as productive labor?

To take another case, of still a different sort, what shall we say of the labor given in well-nigh all communities to the production and sale of intoxicating liquors? Among physiologists the settled conclusion is that tho the use of these stimulants in the lighter forms may lead to no serious harm, that of distilled spirits is overwhelmingly bad. It is certain that an immense

amount of misery and vice comes from the widespread use of strong liquors; that the diminution in their consumption during the last generation or two has brought betterment for mankind; and that the world would be a much happier place if drunkenness could be stamped out. What has the economist to say of labor given to the production of things harmful?

These cases call for discrimination. They may be cases of fraud and deceit. They may be cases of wants misdirected, but none the less wants really felt and really satisfied.

Fraud and deceit mean that a person does not secure that which he expected and was led to expect. In an ordinary sale, the seller is not presumed by the law to give a guarantee as to the quality of the thing sold: *caveat emptor*. But where a guarantee is given, or a precise description equivalent to a guarantee, the buyer has a remedy in the courts.

The distinction made by the law is substantially that which the economist would make. The quack medicine may be a draft of flavored water or disguised alcohol. But so long as the purchaser wants this sort of thing, and buys because he has a notion it will do him good, the purveyor adds to the sum of satisfactions. The case is different where the purchaser wants one thing, and is deceived into taking something else; since then his felt wants are not satisfied. Intermediate is the case where the purchaser does not know precisely what he wants, and is wheedled into taking something which the other man wants to sell. Here it is often difficult to draw the line. Is the buyer foolish, or is he swindled? Does the seller lie outright, or is he merely expansive in praise of his wares? What the law can do is to aid in making the situation clear; and this is particularly needful where the consequences of misunderstanding are serious. Hence the pure-food and pure-drug legislation, and the legislation requiring that the composition of nostrums be precisely stated on their labels.

Where the want is really felt and really satisfied, the labor that brings satisfaction must be adjudged by the economist productive; and this, even tho the ultimate consequences be harmful. The keeper of a dramshop is a productive laborer, even

though he purveys something which often causes misery. To enter on inquiries about the final effect on human welfare would raise many questions of a different sort from those within the strict range of economics; inquiries which, if consistently followed in all cases, would range into almost every field of knowledge. There are physiologists who believe that meat, tho men like it, is unnecessary for nourishment and is frequently a cause of disease. Others maintain that such stimulants as tea and coffee are of ill effect; that health and happiness are promoted by abstinence from them. To judge between these various advocates and reformers is no part of the essential task of the economist. So long as a person who buys a thing or pays for a service really *desires* it, the labor which yields him the satisfaction is productive. The economist is concerned to inquire what labor is productive in this sense and what is not, and what are the various aspects and consequences of men's activities in trying to satisfy their wants.

A case which may call for nice distinction between labor that is productive, even tho morally questionable, and labor that is predatory, is that of the professional gambler. For example, those who maintain the luxurious establishment at Monte Carlo may be regarded, on the one hand, as simply purveying to that love of games of chance which is so universal as almost to be classed as instinct. So far as they do this — so far as the act of gaming is pleasurable to their customers — they supply a satisfaction, even tho it may be desirable for permanent welfare that such craving be kept in check. On the other hand, so far as both parties — croupier and gamester — are merely trying to get each other's money, and care not for the play in itself, the activities of both are predatory. Just what motive underlies the gamester's wagers may be a matter for nice psychological analysis. No doubt the two distinguishable motives — love of play and cupidity for the other man's money — are often combined. There are certainly instances enough where the pleasure of the play counts for nothing, and where cupidity alone is at work; and then the keeper of the gambling establishment is simply predatory.

Returning now to such articles as were considered a moment ago — drugs and alcoholic spirits, whose effects may be noxious — we may note the obvious distinction between saying that a given kind of labor is productive and saying that it ought to be exercised. Tho a want may be satisfied by the labor, it does not follow that happiness, or the best kind of happiness, is promoted thereby. The law may prohibit horse racing or gambling, or the manufacture and sale of liquor, because it is thought best that men should not have the gratifications at all. Whether a prohibition of this kind should be enacted raises questions, to repeat, of very wide range, to whose solution the economist can doubtless contribute, but on which he says by no means the final word. The labor which yields a service may be, in the eye of the economist, strictly productive; but it may be a kind of productive labor which had better not be exercised.

§ 4. The meaning which we affix to the word "productive" is further illustrated by one of those professions which Adam Smith regarded as indeed grave and important, but none the less unproductive — the law. With the lawyer may be grouped the judge, the policeman, the jailer. In a sense, their services are not necessary. They do not conduce directly to the production of material goods or to the rendering of services or utilities to consumers. They are inevitable adjuncts to the processes of production, rather than immediately contributing factors. If all men were honest, truthful, fair-minded, willing to abide at once by the decision of an impartial arbitrator, the work of the legal profession and of all its hangers-on could be dispensed with, or at least reduced to insignificant dimensions. If virtue were universal, policemen and jailers would disappear, and lawyers would have little or nothing to do. Yet the experience of all peoples shows that — men being what they are — the work of the legal profession becomes indispensable in any complex society. As property is accumulated and diversified, as exchanges between men multiply, as the precise relations between different persons come to be carefully defined by law, the business of interpreting the complex system is put into the hands of a

separate profession. The settlement of differences is intrusted to judges; the orderly conduct of affairs is aided by the advice of lawyers; the observance of the law is enforced by the police. No doubt an ill-devised legal system entails more labor of this sort than would suffice under a better system, and the unprejudiced observer must question whether the law of our modern communities works as efficiently as it might. But a clumsy instrument, tho it involves more labor than one well adjusted, is none the less useful.

Similar considerations apply to the army and navy. The immediate object of the soldier's work is destruction. He must be supported by the rest of the community; he does not contribute directly to its well-being. Yet military protection has been thru almost all history an indispensable condition for the sustained conduct of peaceful industry. Like the policeman, the soldier is needed because of the bad passions of man. And even where defense is not necessary, and armaments are maintained from national vanity or senseless rivalry, the soldier nevertheless must be reckoned productive in the sense that he does what people wish to have done and what they pay him for. The army and navy may be only dangerous playthings. But men are no less foolish when they pay for tawdry ornaments or vulgar amusement. It is not for the economist to sit in judgment on their tastes.

There is indeed a situation in which a military force is, from the economist's point of view, clearly unproductive. This is where it is used solely and simply for aggression. A pirate is obviously not a productive laborer. Unfortunately many of the heroes of history have been no better than pirates. The armies of the first Napoleon swarmed over Europe, levying tribute wherever they penetrated. No doubt deep-lying historical forces served to bring on the wars of the Napoleonic period. Some conflict was inevitable between the old feudal order of society and that new order which arose with the French Revolution. But the domineering spirit of Napoleon turned the conflict in its later stages to mere aggression on the one side, ex-

hausting defense against aggression on the other. That defense was necessary; yet all the effort applied both to offense and defense was in the last analysis a fruitless application of labor.

Lest this mode of considering the military be judged shallow by some of our fellow economists — it is likely to be so regarded by many Germans, in whose contemporary civilization preparation for war has played so large a part — let it be added that the bare economic side of the matter is not the only one to be considered. Complex political and social questions present themselves, quite beyond the scope of a book on economics. No range of topics brings out more clearly the need of considering problems that are partly economic from other points of view as well. Even as a problem in economics alone, the industrial progress of mankind has often proceeded in strange ways. Civilization has gone forward on the powder cart, as in our Civil War. Aggression itself sometimes leads to happier ends. The English first took possession of India in a spirit of sheer rapacity. Yet their rule, resting as it still does on force, has much promoted the material welfare of the native races. And in the conflicts between civilized peoples also, whatever their origin, a better order and a higher prosperity have often emerged from wars that were seemingly causeless. Reflections of this sort will occur to every thoughtful reader, and lead him to qualify and interpret what has here been said of the relating of armaments and wars to the principle which underlies the conception of productive labor.

§ 5. There remain to be considered questions as to the relations of certain kinds of activity to the productiveness of labor. Are any of the business doings which go on in modern society to be judged unproductive?

When unscrupulous persons solicit funds from the gullible, ostensibly for "investment" or "speculation," and in due time run off with the money, their labor, systematic and strenuous tho' it may be, is obviously predatory. Not only they, but the clerks and assistants whom they employ (whether these be accomplices or innocent) are unproductive. Now it is maintained that, outside the range of operations so clearly predatory as to

be made criminal by law, there are others, within the pale of the law, whose economic effect is substantially the same. This is alleged, to take a familiar example, of speculative transactions in general. In our highly organized modern communities, an immense amount of buying and selling is done for a turn in the market. A man buys wheat or cotton which he does not want and which never gets into his possession; he promptly sells his nominal title at an advance in price, pocketing what is called a profit. Is any contribution made to the sum of utilities by such transactions? It may be assumed that the pleasure of the game, which may be an element in gambling with cards or dice, here plays but a negligible part; the motive is simply to get gain somehow. The most conspicuous operations of the sort are on the stock exchange, where sales and purchases take place on an enormous scale with no traceable effect in contributing to production or to social income. The business involves an elaborate apparatus, — brokers, clerks, officers, a periodical press of its own. As the clerks of a bare swindler are unproductive, so must be those of the broker, if he is himself in the parasitic class.

But this sort of allegation has been pushed further. A large part of what is ordinarily called "business" has been placed under the same ban. Not only those who are usually called speculators, but those who "operate" in real estate — buy and sell land for a margin of profit — and the bankers who "handle" stocks and bonds are described as mere parasites. Nay, all business men of every kind have been condemned by socialist writers as essentially unproductive — that is, so far as they are not directly doing work of management and superintendence. By them "business" has been adjudged simply a way of securing a gain thru the ignorance or weakness of others, and therefore to be condemned as useless to society.

The questions here raised cannot be answered until after a consideration of some very complex matters. But the mode in which they should be dealt with and the nature of the answers to be sought can be indicated now, even tho with some anticipation of later conclusions. Thus, as regards one of the set of

operations supposed to be unproductive — speculative dealings — it must be admitted that the charge is in part founded. Tho some speculative dealings in commodities and securities serve a useful purpose, others are in large part mere wagers, akin in their economic effect to vulgar gambling.¹ Judged by the test which we have set up — whether the labor adds to the sum of utilities — all those who engage in mere wagering speculation are unproductive laborers: not only the principals, but the brokers who execute their orders, the clerks who record them, the mechanics who put together and operate the "ticker" in the broker's quarters. All belong in the class whose work serves no useful end.

The same test is to be applied to the activity of business men; but here the balance of gain is much clearer. Tho the greater part of speculative dealings is probably of no utility, the greater part of business men's doings has great utility. The indictment of the socialists, which charges that they are predominantly unproductive, overshoots the mark. The function of the manager or leader of industry is of high service in production; even tho, like the banker, he may merely advise and select and promote, taking no direct part in the management of industry. He adds conspicuously to the abundance of commodities and the satisfaction of wants. But it is none the less true that in any large center of industry there will be found plenty of persons engaged in "business" whose doings are essentially parasitic. They pick up a living, perhaps a very comfortable one, by shreds and patches of dealings, by shrewdness in buying and selling, by waiting for land or securities to rise in value. Often they are sober, solid citizens, personally estimable; so indeed are, as a rule, the stock-brokers who provide the facilities for the gambling speculators. These respectable persons would resent with indignation the suggestion that they belong in the predatory and parasitic class. But one of the most remarkable phenomena presented to the student of economics is the ignorance of all sorts of persons regarding their place and function in the industrial world. The broker or merchant, no less than the mechanic or clerk, sees the little corner

¹ Compare Chapter 11.

in which he is at work, and knows nothing of its relations to the community as a whole. The respectability of an employment, and even the spirit in which it is pursued, give no certain clew to its effect on the general welfare.

It is the aim of the legal system under which we live — the system of private property — to inhibit predatory doings. Hence not only physical violence, but fraud and deceit, are forbidden and punished. This aim of the law is in the main attained. He who earns his living in a lawful manner commonly contributes to the sum total of satisfactions. He does what another person is willing to pay him for; or, in the more technical language of economics, he brings forth utilities, and so is a productive laborer. The view, sanctioned more or less explicitly by some socialist writers, according to which the work of manual laborers alone is productive, and all the income-earning and money-making of the well-to-do classes are unproductive, carries the indictment against the existing system too far. But the fact that criticism against the working of private property is exaggerated should not blind us to the fact that there exist opportunities for securing an income or even amassing a fortune, not beyond the pale of the law, yet of a kind which the economist must regard as predatory, and so unproductive.

Some opportunities of this kind are due to imperfections in the law as it stands. With changes in economic conditions, proceedings that once seemed helpful to the promotion of the general welfare, and perhaps at one stage were helpful, cease to be so, or remain so only in part. Thus joint stock companies, or corporations, have proved a device of great efficacy in furthering improvements in the arts and in securing more abundant and varied production. On the other hand, the statutes under which corporations may be organized, especially in our American states, have often made possible precisely that evil of which the socialist critics complain: mere thimblerigging and plundering. The reform of the laws of incorporation in such a manner as to keep the good and reject the evil is now one of the pressing problems in the United States.

To discriminate clearly between the operations that are in the end helpful toward satisfying wants and those that are not, is sometimes impossible even after the nicest weighing of the results by the best judges. The law, for instance, withholds its sanction from mere wagering contracts. Yet transactions which are wagers cannot be distinguished in outward form from others which are useful to society. There is a vague consciousness in the public mind that some persons are engaged in "legitimate" business, while others doing the same sort of thing are "plungers," "illegitimately" occupied. But to draw a precise line between those that may be approved and those that may not, is no less difficult for the business man, however intelligent and wide-minded, than for the judge or the economist. So it is with the law of fraud and deceit. As long as men are free to choose for themselves and act according to their own judgments, those who are shrewd and watchful will make better bargains than those who are dull and unobservant. When does one man over-reach another, when does he simply leave him to judge for himself as to his own interests? The probabilities are that for the sake of securing the large general benefits that flow from private property and competitive dealings we shall always have to permit some doings that are on the line between the productive and the predatory. If the law brings it about that labor is applied in the main to the satisfaction of wants; if it restrains most of the unproductive doings; if the system as a whole works well, and these predatory operations are only its loose ends — it will be better to accept them as inevitable and to set off against them the general benefits. Absolute perfection in human arrangements is not to be looked for.

CHAPTER 3

THE DIVISION OF LABOR AND THE DEVELOPMENT OF MODERN INDUSTRY

Section 1. Two forms of the division of labor: the simpler and the more complex, 30 — Sec. 2. Advantages from the simpler form: dexterity, continuity, adaptation to aptitudes, 31 — Sec. 3. Advantage from the more complex form: the development of machinery. The industrial revolution of the eighteenth century. The use of nature's power, 33 — Sec. 4. Division of labor means unconscious coöperation. Exchange, 37 — Sec. 5. Exchange formerly covered a limited economic area. Cheap transportation (railways) makes the area wide, 38 — Sec. 6. Wider markets bring more minute division of labor. Illustration from butcher's trade, 41 — Sec. 7. The geographical division of labor, illustrated by the United States and Great Britain, 43 — Sec. 8. Two sorts of gain from geographical division of labor, 45.

§ 1. The division of labor is one of the great central facts in modern society. From this arise some of the most difficult questions of economic theory, the most common popular fallacies, the most serious problems of legislation.

The division of labor may be analyzed under two heads. On ① the one hand there is the simpler form, under which a workman carries thru the whole of one of the stages in production. The tailor, the cobbler, the carpenter, ply their several trades. On ② the other hand there is the more complex form, under which there is a splitting up of several operations all belonging to one stage of production. In more primitive stages of industry the shoemaker might be a tanner, and the whole process of converting the rawhide into a shoe thus be in one hand. Nowadays, the shoe itself is not put together by the cobbler; it is the work of a large number of different workmen in a factory, of whom some do nothing but cut the leather, others stitch it, others put on the soles, still others the heels, and so on, with an elaborated parceling of different operations.

Obviously, a hard-and-fast line cannot be drawn between these two forms. No craftsman carries thru from beginning to end any one operation in production. The tailor buys his materials of the cloth maker; the cloth maker buys his wool of the farmer or grazier. The cloth maker and the grazier in turn buy tools of the mechanic, who buys materials from the ironworker and woodworker. On the other hand, the tailor does not necessarily carry his own work thru even the whole of the stage with which he is concerned. It may be divided between the cutter and the stitcher; and similarly the cloth maker's may be parceled out between the weaver, the fuller, the dyer. The difference between the simpler and the more complex division of labor is essentially one of degree. Nevertheless, this difference of degree is important. The two sorts of arrangement bring about somewhat different advantages and give rise to different social conditions.

§ 2. Let us consider first the simpler division of labor. This dates far back into antiquity. The familiar crafts are of very old standing. The extent to which their names have been adopted as surnames shows how, among modern peoples, occupations were separated in a comparatively simple state of society, such as that of the Middle Ages, when patronymics were in process of formation. The Carpenters, Masons, Smiths, Weavers, Drapers, Tailors, Dyers, Saddlers, Shoemakers, Millers, Bakers, Coopers, and such other common surnames indicate what sort of division of labor was maintained for hundreds of years with comparatively little change.

The chief advantage in production from this form of the division of labor is the gain in dexterity which comes from the constant practice of the same occupation. So familiar are we with the effect of practice that we assume as a matter of course the skill which comes from it. Reading, writing, the donning of our clothes and the lacing of our boots are effected with ease, almost without effort, from the ingrained effects of habit and iteration. Piano playing and typewriting are marvelous to the inabituated, easy to the point of indifference for the practised

hand. The acquired dexterity of the craftsman and mechanic make their productive capacity vastly greater than it would be if each had to carry on a dozen occupations and were half proficient in any one.

Other gains have also been enumerated as accruing from the simpler division of labor. There is a saving in time when the same task is followed without interruption. The carpenter, even tho no more dexterous than the farmer, can yet accomplish more in the hour or the day than the farmer who tries to do jobs of tinkering in his spare moments. Something also is due to the adaptation of tasks to the abilities of the workers. There are differences between the inborn abilities of individuals even as regards tasks for which training and practise are the most important causes of dexterity. Among mechanics a certain proportion only have the sure eye and the deft hand which are required for the most exacting tasks. It is obviously advantageous that they should confine themselves chiefly to these, leaving the less exacting to persons of ordinary capacity. Even for comparatively simple occupations there are differences in the qualifications of individual workmen. The work of a motor-man on an electric car seems of the most monotonous sort, easily accomplished by any adult. Yet it requires a certain steadiness and alertness of attention not possessed by all laborers. How far differences of this sort are the result solely of inborn qualities, how far brought about or accentuated by education and environment, need not here be considered. So long as they exist, there is a gain if each individual is called on to do only that for which he has the greatest aptitude.

The last-mentioned factor in the division of labor — the adaptation of tasks to varying aptitudes — is of most importance as between those who work with their heads and those who work with their hands. Tho there is mental training as well as manual training, and tho instruction and practise tell in the lawyer's trade as well as in the mechanic's, inborn abilities are important in greater degree for the former. This is more particularly the case in all work which calls for initiative, superintendence, direc-

tion. There is a difference of far-reaching effect between those who have the qualities for leadership, whether in the arts or in intellectual life, and those who must belong to the rank and file. There is often a very great gain when those who are born leaders can devote themselves solely to the work which they alone can do, or which they can do best, leaving to others, with no such capacities, the routine mechanical or clerical work.

The great mass of men, however, have no special aptitudes. For them, continued practise, begun or aided by systematic training, is the chief cause, even tho not the only cause, of skill in any particular sort of work. In the main, the division of labor is a cause rather than a result of specialized capacity. Most dexterous men are so because they have long practised a given art; they do not practise it because they are born with dexterity.

§ 3. Let us turn now to what we have styled the more complex form of the division of labor. This is the salient characteristic of the development of industry during the last century and a half; a development which has gone on with accelerating pace in very recent times. The change in industry and the nature of the new order of things can be described most concisely by saying that the tool has been replaced by the machine.

Tho the gain in efficiency from the division of labor arises chiefly from the dexterity acquired by repetition, none of the trades familiar under the simpler division of labor was reduced to the continuous repetition of identical movements. The carpenter, the mason, the smith, the tailor — each was master of his trade as a whole, and, while gaining proficiency from unceasing practise, yet turned from one part of the occupation to another. The instruments which these artisans used were tools of varied kinds, adapted to the different parts of their occupations. A "tool," as that word is still commonly used, means a hand tool, put in motion by human force and requiring adaptation, judgment, flexibility.

The gradual elaboration of the division of labor slowly enlarged the number of occupations, diminished the range of each one, and tended to reduce each more and more to an identical

routine. Thus the making of cloth was divided between the spinner, the weaver, the fuller, the dyer. The division between the spinner and the weaver, itself one of the oldest, became eventually of much moment, for it gave occasion for one of the epoch-making applications of machinery and power. When the steady repetition of the same movement becomes an important part of an industrial art, it is possible to apply other force than that of man's muscles. No machine, even in the highly elaborated forms of modern times, can rival in dexterity and flexibility the human hand. But whenever the same thing is to be done over and over, the blind forces of nature, working thru a machine, can do it as well as any human hand, and indeed better than most human hands. The division of labor in its simpler form gradually was developed to the point where the application of power was possible. The gain from the application of power proved so great that there was a reaction on the division of labor: an inducement to split up the steps in production still further, to reduce more and more of them to the repetition of identical movements and so to make possible in still greater degree the use of natural forces.

The great change toward the use of machines and power set in during the second half of the eighteenth century. The textile trades felt its influence first. In 1764, Hargreaves invented the spinning jenny; in 1769, Arkwright brought out his rival spinning machine; in 1779, Crompton invented an apparatus which combined the devices of Hargreaves and Arkwright, and brought the spinning machine to a still further stage of perfection. All three were directed to the mechanical repetition of the twisting of the fiber; and water power was soon applied to setting them in motion. Not long afterwards, weaving was also subjected to the same principles. The power loom was gradually elaborated, and in the beginning of the nineteenth century began to supplant steadily the hand loom. By the close of that century, the old-fashioned weaver's trade had become, in advanced countries like England and the United States, a thing of the past. The textile material to which these inven-

tions were first applied was cotton; for this has an even and homogeneous fiber which makes it most readily available for machinery operated continuously at uniform speed. Wool, linen, and silk, being of less even fiber, were subjected to the machine process later than cotton, thru a long series of subsidiary inventions. It has not been until our own day that silk, the most delicate and irregular of these fibers, has come to be manipulated on a large scale by power machinery.

Water power was used for the textile manufactures in their earlier stages; but it was soon supplemented and largely replaced by the steam engine. The steam engine was brought by Watt to the stage of effective working in 1781. It was first used on a large scale for the pumping of water out of mines — an obvious case for the application of power, since it calls for the unchanging performance of the simplest movements. It was soon applied further, not only to the textile industries and to a wide range of other manufactures, but to transportation. Steam was used in navigation by Fulton on the Hudson River in 1807. An even more important application of steam to transportation came when the locomotive was perfected by Stephenson in 1830. This created the modern railroad, and, as we shall presently see, marked the beginning of a still further development of the division of labor.

The series of great inventions, of which these were the most important, brought about what is known as the Industrial Revolution — a change in the arts, and a consequent change in economic and social conditions, greater than has appeared during a like short time in any stage of human history. Its fundamental economic characteristic has been the elaboration of the division of labor, thru the splitting up of the stages of production into separate operations each one of which is repeated continuously and so may be carried on by the machine. The carpenter's sawing, planing, joining, molding — each of these is now done separately by machinery, usually in establishments, that tend steadily to become larger and larger and to subdivide still more the various operations of the trade. The cobbler of

former days put together a shoe for himself; in a modern factory the shoe goes thru some eighty different processes. In the manufacture of files, there were (1912) in one large establishment ninety separate operations or handlings thru which each individual piece had to go from the time the steel reached the factory until the time when the finished files were ready for sale. So it is with ironworking, with all the elaborated processes of the textile industries, with printing and book-making, not least with the very making of machines and tools. The machines now used are vastly more complex and more efficient than was dreamed of in the early stages of the application of power, and have extended the principle of the automatic repetition of identical movements to tasks long thought far beyond its scope. The work of the hand is not indeed superseded; the skillful workman and the adaptable tool retain a large place in industry; but the range of their work tends to become more and more restricted. Within each branch of industry, as one stage after another is subjected to the machine process, the remaining stages have a narrower and simpler range, in which inventive spirit constantly finds new opportunities for the application of power. Thus the character and the working of the division of labor have been profoundly and all but universally modified.

The essential gain from this modern development of the division of labor has come from the virtually unlimited store of natural power. Once identity of movement has been secured, there is no work so heavy, no operation so delicate, but that the machine can repeat it day in, day out. Human labor, applied first to putting together the machine, then to guiding the natural forces that move it, accomplishes vastly more than the same amount of labor applied to the making and using of the simpler tools of former days. Coal and falling water are the great sources of power; and tho nature does not supply them without limit, the application of machinery has not yet been fettered for human needs by any limitation, nor is it likely to be fettered in the future as far as we can look forward into it. The labor required for any one operation in production has been immensely lessened by the

industrial changes of the last century, and appears likely to be lessened no less rapidly and largely in the century before us.

The period in which we live has been aptly called the age of machinery. Its characteristic phenomena are mainly the results of the use of machinery; and they will engage our attention in many parts of our subject. They are seen in the growth of capital, and the increasing power and importance of the business man who has control of capital; in the spread of production on a large scale, and the tendency to monopoly in many branches of industry; in a new position of workmen, a wider gap between employers and employees, and a consequent development both of labor organizations and of employers' associations; in grave social problems from the employment of women and children in factories; not least, in a loss of individuality in the working population and a strengthening of the lines of demarcation between social classes. Of all these consequences of the complex division of labor more will be said as we proceed.

§ 4. The division of labor obviously means that the persons who carry on the several operations of a given branch of industry combine to bring about the final result. It means, no less clearly, that those engaged in different industries combine to satisfy the varied wants of the community. Each contributes his special product to be used by all; each uses the products contributed by the rest. The division of labor may thus be described also as the combination or coöperation of labor.

Combination of labor may conceivably be carried out deliberately, with conscious control and coördination, with immediate sharing of the joint output, and without exchange. In the ancient civilizations of Greece and of Rome we get glimpses of establishments of the rich and privileged in which the several trades are plied by slaves for the benefit of the whole household. In the earlier Middle Ages also we find seigniorial possessions, where the serfs have specialized occupations and contribute in kind to the lord's needs. Even in modern times, we have examples of communistic societies, in which there is a division of labor among the individual members, yet no exchange; each member con-

tributing his part to the common income and each receiving from that income a share deemed equitable. Such a society does not approach so nearly to self-sufficiency as the ancient household, or the medieval estate; it must buy and sell on a considerable scale with the outside world, whereas those earlier organizations bought very few things (salt and iron, for example). Yet within its own limits the division of labor leads to no exchange between members.

Commonly, however, the division of labor has brought with it as a natural corollary the *exchange* of the several commodities produced by different workers. The cases noted in the preceding paragraph are comparatively rare in economic history; at all events, they give no clew to the phenomena of the modern industrial world. In this the division of labor almost always means exchange, and the relation between the workers is very different from that in the community where there is conscious and deliberate combination of effort. It is strictly true that the workers in a modern society combine in bringing about a joint output; but the consciousness of coöperation is lost. The individual is not thinking of the joint output. Only if he happens to be versed in the books and theories of economic writers, and bears them in mind in his active hours, is he aware that he is carrying on one small operation toward a joint output and shares in the manifold contribution which others make to that joint output. The things on which he works are not part of a common store, but are private property, bought and sold, cared for and guarded, by each individual for himself. He thinks only of the particular product which he sells, and of the terms on which he can buy other products. He is intent on the results of the exchange thus made, and tries to secure for himself the best terms of exchange. Private property and exchange are well-nigh universally the consequences of the division of labor, and the phenomena of exchange are the dominant phenomena of the modern world.

§ 5. For some centuries preceding the industrial revolution of the eighteenth century, the typical form of exchange was that

between the small city or town and the agricultural region immediately surrounding it. This was the period of the simpler form of the division of labor, of the familiar handicraft; the period of the tool preceding the modern period of the machine. The city of early modern times was the center of an industrial community which was in the main self-contained. Within the city the burghers carried on the arts and crafts. To it the surrounding rural population brought food and materials, and in it they made their purchases. The city craftsmen were united in the gilds which were so conspicuous a feature of the economic organization of that period. Each craft was open only to the members of a gild, who trained apprentices and employed journeymen, and transmitted from generation to generation the knowledge of its trade. The organization of the gilds, and the regulation and restriction of their membership, were inevitable and doubtless beneficial at the outset, assuring protection and mutual aid, and the maintenance of skill in the arts. In later times, their regulations were made the means of monopoly; they had long outlived their usefulness even before the great inventions of the industrial revolution put an end to the economic organization of which they were a part. But these are aspects of the gild system not closely related to our present topic. So far as it bears on the division of labor, it was part of what the Germans called *Stadtwirtschaft* — the city organization of industry. A map of England and of the greater part of western Europe from say 1350 to 1800 is dotted with a large number of cities of modest size, each the center of a more or less isolated economic area. There was, indeed, some exchange of special commodities between different countries and between the different economic areas within a country; but the main exchanges were between the city and the surrounding agricultural district, and the characteristic stage of the mechanical arts was that of the division of labor between the familiar crafts organized in the medieval gilds.

The steps through which this organization of industry has been replaced by that characteristic of modern times were at first slow and gradual. But in the eighteenth century, the industrial revolu-

tion brought a sudden burst of great changes. Without pausing to consider the events of the sixteenth and seventeenth centuries, which prepared the way for these changes, we may contrast the final result with the conditions of the early simpler division of labor, and so understand better the conditions of our own day.

The economic area has been immensely widened. It has come to include the whole of a country, in some respects the whole of the world. There is division of labor not only between the different crafts within a city, but quite as much between different cities and countries. On the other hand, the crafts themselves have been split up into more minute subdivisions, and different parts of each are practised in widely separated localities. These tendencies have been immensely promoted by the modern improvements in transportation — improvements which have themselves been the results of the introduction of machinery. The use of power, especially thru the steam engine, was the dominant factor in the industrial revolution; and in no direction has it had larger effect than from its application to traction and to navigation.

An epoch-making invention was that of the locomotive. Roads had been much improved in England during the latter part of the eighteenth century, when Telford and Macadam devised their methods of constructing roadways. During the same period canals had also been dug, and used to no small extent both in France and in England; and the people of the United States, always driven by their special industrial conditions to search eagerly for improvements in transportation, pushed the use of roadways and canals in the first quarter of the nineteenth century. But in 1830 came the locomotive. In this case, as in that of the steam engine, the final attainment of the successful device was due to a long series of experiments by many contrivers. Stephenson in 1830 perfected rather than invented the locomotive. So the modern railway was created; and thereby began a second industrial revolution, or at least a second phase of the industrial revolution. Side by side with the railway have been the great im-

provements in water transportation. The application of steam to navigation, thru the paddle wheel, was a comparatively simple matter and was accomplished early in the nineteenth century. But the paddle-wheel steamer was too clumsy, too liable to damage in storm for communication across great bodies of water; and it was not until Ericsson's invention of the screw, in the middle of the nineteenth century, that ocean navigation underwent a great change. This change in any case was not so far-reaching as that wrought by the railway; for water transportation by sailing vessels had always been comparatively cheap, whereas land transportation had been slow and dear, and its dearness had imposed great obstacles to the division of labor within large land areas.

§ 6. As Adam Smith remarked in 1776, in the earlier stages of the modern era, the division of labor is limited by the extent of the market. The village cobbler will turn out no more shoes than it is possible to dispose of within the economic area he can reach. To divide the work of shoemaking between the cutter, the stitcher, the heeler, the laster, is not feasible unless as many shoes can be marketed as the combined labor of all will produce. A modern shoe factory, with its elaborate machinery and highly developed division of labor, turns out thousands of pairs of shoes daily. These shoes can find their purchasers only in a large population reached from the central source of supply.

Many other illustrations could be given of the way in which the division of labor has been pushed farther and farther with the extension of the market consequent on cheapened transportation. Furniture is made nowadays in large factories, often placed near the sources of timber supply and distant from the persons who are to use the articles. The cabinetmaker of olden days has been replaced by workmen who tend and direct a series of machines, each of which performs unceasingly its part in the operations of sawing, planing, grooving, turning, polishing. Plows are no longer made by the village blacksmith, but put together in the great factory and then distributed broadcast over the earth. Unless it were possible so to distribute them, plows could not

be made in quantities at the factory, and there could be no elaborated division of labor in making them. One of the most striking results of the widening of the market is seen in the transformation of the butcher's trade. Until within the last thirty years, the butcher carried on his work as he had done it for thousands of years before. His cattle came from near-by farmers, and the meat was supplied to near-by customers. Thru the larger part of the United States, he has now been supplanted by the great packing establishment, where cattle are slaughtered by the thousand. In these establishments dozens of different stages in dissecting the carcass are allotted to as many different sets of workmen. The application of power has not here been carried as far as in some other industries; yet at every stage where it is possible, the machine is set to work; and where it is not, the workman is assigned to the unceasing repetition of a single operation.¹ Every part of the animal is used, and every part is manipulated on a large scale under a further minute division of labor. The output in all its varied forms — the meat of all qualities, the fat, the hide, the bones, the horns, the very hair — is then

¹ "It would be difficult to find another industry where division of labor has been so ingeniously and microscopically worked out. The animal has been surveyed and laid off like a map; and the men have been classified in over thirty specialties and twenty rates of pay, from 16 cents to 50 cents an hour. The 50-cent man is restricted to using the knife on the most delicate parts of the hide (floorman) or to using the ax in splitting the backbone (splitter); and, wherever a less skilled man can be slipped in at 18 cents, 18½ cents, 20 cents, 21 cents, 22½ cents, 24 cents, 25 cents, and so on, a place is made for him, and an occupation mapped out. In working on the hide alone there are nine positions, at eight different rates of pay. A 20-cent man pulls off the tail, a 22½-cent man pounds off another part where good leather is not found, and the knife of the 40-cent man cuts a different texture and has a different 'feel' from that of the 50-cent man. Skill has become specialized to fit the anatomy. . . .

"The division of labor grew with the industry, following the introduction of the refrigerator car and the marketing of dressed beef, in the decade of the seventies. Before the market was widened by these revolutionizing inventions, the killing gangs were small, since only the local demands were supplied. But when the number of cattle to be killed each day increased to a thousand or more, an increasing gang or crew of men was put together; and the best men were kept at the most exacting work" — Professor J. R. Commons, in the *Quarterly Journal of Economics*, Vol. XIX, pp. 3, 6. It will be noticed that here there seems to be scope for that advantage from the division of labor which is secured from the adaptation of the tasks to the varying abilities of the several workers. Cp. p. 32, above.

marketed to millions of people, distant hundreds of miles, sometimes thousands of miles, from the packing establishment. All such elaborate organization and division rest on the possibility of transporting the products a great distance, and so supplying an enormous population from one central point.

§ 7. The great improvements in transportation during the nineteenth century have given immensely wider scope to a phase of the division of labor which we have not yet considered. This is the geographical division of labor.

In medieval and early modern times, those articles only could be transported for any considerable distance which had great value in small bulk. Such were drugs, spices, fine cloths, rare silks and cottons, choice weapons and armor. These were used chiefly by the small circle of the rich; trade in them did not affect the mass of the population. Where water transportation could be used, there was indeed some possibility of trade and exchange in the bulkier commodities. For this reason, England, with her insular position and much-indented seacoast, was able at a comparatively early stage to export such commodities as wool, copper, and tin, and to develop in some degree the geographical division of labor. With the improvement and enlargement of vessels, the greater security of the seas, and the use of the mariner's compass, trade by water gradually grew to greater and greater dimensions. A still further extension came in the latter part of the eighteenth century, when parts of the interior of the civilized countries were tapped by canals. But the most far-reaching development of the geographical division of labor came with the railway; for the railway can reach all parts of the land. The industry of almost every part of the world has been transformed by this mighty solvent.

The United States at the present time presents what is probably the most extreme case of geographical division of labor highly developed under the influence of cheap transportation. The southern part of New England is a manufacturing hive. The food and raw materials there used come from all parts of the world. The wheat and other breadstuffs come from the Mississ-

sippi and Missouri valleys; the meat and animal products from the same regions, and some from regions farther west; the cotton from the southern states; the wool from the trans-Missouri region, Australia, Argentina, China, Siberia. All sorts of manufactured articles are sent from New England in exchange — cotton and woolen fabrics, boots and shoes, metal wares, tools and machinery. The anthracite district of eastern Pennsylvania, again, is given wholly to the mining of hard coal; all its manifold supplies come from without. Pittsburgh is the center of a district in western Pennsylvania given wholly to the mining of bituminous coal and to manufactures which use that fuel, such as iron and steel and glass. Here too, the food, clothing, articles of comfort and luxury, are obtained from all parts of the United States and of the world. No part of the country is self-sufficing; each is constantly sending its products to distant regions, and in return receiving the products of distant regions.

An example no less striking of the geographical division of labor is to be found in the present condition of Great Britain. That country now imports the greater part of its food — four-fifths of its breadstuffs, and more than half of its meat and other food supplies. Its wheat comes chiefly from the United States, Canada, Russia, Argentina; its meat very largely from the United States and Australasia. All the cotton and almost all the wool which serve to clothe its people are brought from other countries. These various commodities, as well as the others which come from tropical regions, are obtained in exchange for a great range of manufactures exported. The people of Great Britain, by devoting their labor chiefly to manufactures and exchanging them for the imported foodstuffs and raw materials, get vastly larger returns than they could by producing everything at home. New England and old England are in substantially the same industrial position. It is probable that neither could support its present population on its own soil; it is certain that neither could satisfy in this way the imperative needs for food, clothing, shelter, warmth, except on very much harder terms and with very much scantier results. Each is dependent on trade with other regions; the main differ-

ence being that in the one case virtually the whole of the trade crosses the political border, and in the other the larger part of it is within the same nation.

In consequence of this highly developed division of labor, the position of cities is essentially different from what it was in mediæval times. They are no longer dependent for food and materials on the agricultural regions surrounding them, nor do these regions depend on the adjacent cities for their supplies of manufactured commodities. As regards the country surrounding them, the cities are centers for the distribution of goods rather than for production. Many cities have special articles of manufacture, and in this sense are producing centers; but their specialties are disposed of over all the world thru the distributing centers. The very large cities, with a wide range of miscellaneous manufactures, and with a great distributing trade, overlap in their economic areas.

§ 8. The gains from the geographical division of labor are of two sorts, analogous to the two sorts of gain from the division of labor between individuals. In part they arise from the adaptation of different regions to the production of specific articles, and in part from the proficiency which is the result of exclusive application to one task.

The division of labor between tropical and temperate countries obviously brings the gain arising from specific adaptation. Tropical fruits, spices, coffee, sugar, are exchanged for the wheat and corn of temperate climes. The southern part of the United States, again, has a climate peculiarly adapted for growing cotton; while in the great central plains there is a corn belt and a wheat belt — great stretches of country with climate and soil peculiarly adapted to one or the other of the staple cereals. The abundant deposits of excellent coal in the western part of Pennsylvania cause that district to devote itself to coal mining, and to the industries for which cheap fuel is essential. Extraordinary deposits of iron ore have been found on the shores of Lake Superior, and thousands of workmen there mine the ore, procuring from other parts of the country all the varied articles which they consume. Italy

has a climate adapted to the culture of the grape and of citrus fruits, and she exports them to the countries of more rigorous climate. Italy has no coal; she imports it, chiefly from the great beds of Great Britain. The enumeration might be indefinitely extended. It is obvious that there is a gain when the wheat and corn are produced in the regions favoring them, the iron and coal where they are most abundant, the cotton where the soil is best. The geographical division of labor is not indeed all-embracing; there are obstacles to its sweeping application from such causes as the force of custom and cost of transportation. Yet there is a strong and steady tendency toward the pursuit of a branch of production in that place for which the natural advantages are greatest.

Different in origin and basis, tho the same in effect, is that division of labor between different regions which rests on the mere fact of specialization and acquired skill. Exchange between individuals, tho based in part on differences in native aptitudes, rests in the main on acquired dexterity. So it is in considerable degree between different regions. When once an industry is conducted on a large scale, with elaborate machinery and with a great output, it will tend to be concentrated. But there may be no strong reason for its concentration at one place rather than another. There is no cause in the natural conditions why Bridgeport and New Haven in Connecticut should be specialized centers for the manufacture of metal wares, Brockton in Massachusetts for shoes, Cohoes in New York for knit goods, Nottingham and Bradford in England for laces and woolen stuffs, Lyons for silks, Chemnitz in Saxony for hosiery.

For certain sorts of industries there is simply a gain when a number of establishments carrying on operations of the same sort are clustered together. Subsidiary industries spring up, supplying them with materials or accessories. When workmen skilled in particular operations are required, their selection and adaptation is easier. The mere attractiveness which a city has for most persons makes it easier to secure and retain a steady force of laborers. Sometimes the first cause of the location of an in-

dustry in a particular place has been the energy, ingenuity, resource, of some individual. His capacity as leader builds up an establishment; others then follow his lead. Sometimes the natural adaptation of a spot causes an industry to spring up in that spot, and later to persist from the mere effect of acquired advantage. Thus some of the manufacturing cities of New England, such as Lowell and Lawrence, grew up on sites having water power, before steam power was as fully developed as in later times, and when the transportation of coal was more costly. It is doubtful whether the water power would now cause these centers of population to be built up; but being there, they tend to remain. All thru the broad, flat country of the Mississippi Valley there have sprung up cities and towns, of which one is the seat of the manufacture of vehicles, a second of furniture, a third of engines and machines, with no obvious causes why one place rather than another should possess the particular industry. In whatever place the industry is, the advantages of concentration are secured. A wide market from cheap transportation makes possible the conduct of the industry on a large scale and so the use of much capital, of elaborate machinery, of specialization, and minute division of labor.

A considerable part of the division of labor between nations, and a large volume of trade between them, seem to rest on this second cause. Especially as regards manufactured articles, some countries have advantages in production which rest not on natural resources, but on acquired efficiency. England's manufacture of certain kinds of woolen goods, the silk manufacture in France, perhaps the linen manufacture of the north of Ireland, present cases of this kind. This is the real basis of the argument for protection to young industries. So far as the division of labor between countries and their trade are the results of natural differences, they are best left to work out their results without restriction. But so far as they rest on acquired skill, there is at least a possibility that they may be superseded to advantage by similar division of labor and similar trade within the country.¹

¹ See what is said on this subject in Chapter 37, § 2.

CHAPTER 4

LARGE-SCALE PRODUCTION

Section 1. Growth of large-scale production illustrated by certain industries: cotton goods, iron, agricultural implements, 48 — Sec. 2. Advantages of large-scale production: use of machinery, saving in general expenses, buying and selling, utilization of by-products, experimenting, 52 — Sec. 3. Limitations, chiefly from difficulties of superintendence. The case of agriculture. Other industries. Scarcity of able managers as a cause of limitation. This human factor usually ignored by the socialists, 54 — Sec. 4. Combination, horizontal and vertical. The Steel Corporation as an example. Other examples. The tendency to vertical combination less strong than that to horizontal, 58 — Sec. 5. Competition often wasteful; tho the waste is less than it seems. Combination rules only over part of industry, 64.

§ 1. The tendency to large-scale production has shown itself in all civilized countries since the industrial revolution. It has profoundly modified social as well as economic conditions, and bids fair to modify them still further in the future.

The characteristic features of the tendency are that the size of the individual establishment becomes larger and the total number of establishments becomes smaller. In a period of very rapid growth, it may happen not only that each unit becomes larger, but that the total number increases. More commonly, however, the total number decreases or at best remains stationary; while yet the individual establishment becomes greater in size, and the productiveness of the industry as a whole is much enlarged. The following figures from the census publications of the United States, indicating the growth of some great manufacturing industries during the period from 1850 to 1915, will serve for illustration.

The figures in all three cases tell essentially the same story. The total capital, the total product, the total number of persons employed, increase at a very rapid rate. Not so the total number of establishments. In the case of cotton goods, it remains on the whole constant; for iron and steel, decreases slightly; for

AGRICULTURAL IMPLEMENTS

YEAR	NO. ESTAB- LISHMENTS	WAGE- EARNERS	CAPITAL (IN MILLIONS)	PRODUCT (IN MILLIONS)
1850	1,333	7,220	\$ 3.6	\$ 6.8
1860	1,982	14,814	11.5	17.6
1870	2,076	25,249	34.8	52.1
1880	1,943	39,580	62.1	68.6
1890	910	38,827	145.3	81.3
1900	715	46,582	157.7	101.2
1905	648	47,394	196.7	112.0
1910	640	50,551	256.3	146.3
1915	601	48,459	338.5	164.1

IRON AND STEEL

YEAR	NO. ESTAB- LISHMENTS	WAGE- EARNERS	CAPITAL (IN MILLIONS)	PRODUCT (IN MILLIONS)
1850	468	24,874	\$ 21.9	\$ 20.4
1860	542	35,189	44.6	52.8
1870	808	77,555	121.8	207.2
1880	792	140,798	209.9	296.6
1890	719	171,181	405.8	478.7
1900	668	222,490	573.4	804.0
1905	605	242,640	936.3	905.8
1910	654	278,505	1,492.3	1,377.2
1915	587	278,072	1,720.7	1,263.3

COTTON GOODS

YEAR	NO. ESTAB- LISHMENTS	WAGE- EARNERS	CAPITAL (IN MILLIONS)	PRODUCT (IN MILLIONS)
1850	1,094	92,286	\$ 74.5	\$ 61.9
1860	1,091	122,028	98.6	115.7
1870	956	135,369	140.7	177.5
1880	1,005	185,472	219.5	210.9
1890	905	218,876	354.0	268.0
1900	1,055	302,861	467.2	339.2
1905	1,154	315,814	613.1	450.5
1910	1,324	378,880	822.2	628.4
1915	1,328	393,404	899.8	701.3

agricultural implements, decreases sharply. There has been thruout the half century a great and combined advance in the average capital, the average product, the average number of employees.¹

These three cases have been selected as illustrations, because they represent different stages in the march of large-scale production. In the cotton manufacture the change during the half century was least. By 1850 that industry was already established on the factory basis, and since then no essentially new forms of organization have developed. The iron manufacture (that is, the making of crude iron and steel) shows relatively a greater change. Most marked of all is the transformation in the third case. In 1850 agricultural implements were still made in the main on a small scale, and by handicraft methods. Since then

¹ The figures are taken chiefly from Special Reports of the Census of 1905 (Part IV, Table 1, for Agricultural Implements; Part IV, p. 4, for Iron; Special Report on Combined Textiles, Table 1). For iron, the figures for 1850 and 1860, added from the Census Reports for those years, are of uncertain value. The number of establishments making cotton goods in 1880 is swelled by the inclusion under that head of some outlying establishments. The subject to correction for these reasons and for others, the statistics are sufficiently trustworthy.

In the interpretation of the figures, however, it must be borne in mind that they do not tell the whole story. In the case of agricultural implements the abrupt decline in number of establishments between 1880 and 1890 is explained largely by a revised method of classification in the census bureau.

For the years subsequent to 1890, the average per establishment is kept low, and the growth of large-scale operation obscured, as regards both agricultural implements and iron and steel, by the fact that a considerable number of small establishments survive, side by side with a few very large ones. These few very large ones are really representative of conditions in the industry; but the census figures do not convey this fact. Further, in all three industries, and especially the iron manufacture and that of agricultural implements, combination and large-scale operation have been going on in forms of which the census figures do not take account. The census regards an establishment in any one place as independent and separate, even tho' it be owned and managed by persons or corporations having establishments of the same sort in other places. As a matter of fact, during the last decade or two, establishments in different places have come largely under the control of the same corporations or individuals; hence the drift toward concentration is more marked than the figures indicate. And finally regard must be had to the effects of changes in prices on the stated volume of capital and product. During the period up to 1900 there was a tendency to falling prices of the articles selected; hence the increase in the output per establishment was greater in terms of quantity (tons of iron or yards of cloth) than in terms of money value. After 1900, on the other hand, the tendency of prices was upward, and a similar correction would have to be made the other way.

large-scale production has transformed the industry in even greater degree than the figures indicate; for the stated number of establishments is swelled, and the averages per establishment are kept down, by the survival of a large number of petty shops.

A similar general tendency shows itself in all the advanced countries: large-scale production gains ground. Yet it must not be supposed that the growth is such as to have crowded out all enterprises of small or moderate size, or even to indicate that in the course of time they must disappear entirely. Figures enabling comparisons to be made for successive periods and for all the industries of a given country are not easily found. The following are available, for Germany, and are significant. They show what percentage of the total persons employed in Germany were engaged, at certain dates, in manufacturing establishments of different size.

	1882	1895	1907
Per cent of persons doing work alone	25.2%	16.4%	10.1%
Per cent of persons in establishments employing 2 @ 5 persons	29.9	23.5	19.4
Per cent of persons in establishments employing 6 @ 10 persons	6.0	7.2	6.6
Per cent of persons in establishments employing 11 @ 50 persons	12.6	16.6	18.4
Per cent of persons in establishments employing 51 @ 200 persons	11.9	17.0	20.1
Per cent of persons in establishments employing 201 @ 1000 persons	10.9	13.9	17.3
Per cent of persons in establishments employing over 1000 persons	3.5	5.4	8.1

It will be seen that the one-person establishment, and those employing five persons or less, lost ground greatly. Those in the next tier (6 to 10 employees) held their own; all the others gained, and the very greatest rate of gain was in the class of very large establishments.¹

¹ I take these figures from Professor Bücher's paper in the *Zeitschrift für die gesamte Staatswissenschaft*, 1910, Heft 3, p. 430. Professor Bücher points out that for Germany, as for the United States, census figures do not tell the whole story of the growth of large-scale operations, since several establishments forming part of one combined enterprise are frequently reckoned by the census as separate and independent.

§ 2. The causes of the growth of large-scale production are to be found mainly in the revolutionary changes in the arts during the last century and a half. Underlying them all is the increasing division of labor and the increasing use of machinery. A necessary condition has been the widening of the market under the influence of cheaper transportation.

A tool or machine of any kind is advantageous only if it is used for a number of operations. The greater the number of operations, the more is it worth while to have an elaborate tool, and to give much labor to its making. Machinery moved by power is a highly elaborate tool. The larger the scale on which an enterprise is conducted, the better is the opportunity for using machinery to advantage. The gain from its use arises from several sources. Power itself becomes cheaper per unit as it is applied on a large scale. Both for first installment and for running expenses, a large steam engine costs less, for each horse power, than a small one; which means economy if the establishment is large enough to utilize all the power supplied. Again, subsidiary operations can be carried on to advantage by machinery. The use of steam shovels in handling coal, ores, earth, and of similar instruments for loading and unloading vessels, depends on the work being massed in large quantities at one spot. An ocean steamship of 10,000 tons carries freight more cheaply than one of 5000, and one of 20,000 tons more cheaply still. Wherever the traffic is heavy, as between Europe and the United States, the huge steamship is economical. Where the traffic is less heavy and less regular, as in the trade with South America and outlying regions, the ship of moderate size holds its own. The greatest of the American corporations making agricultural implements, one that illustrates conspicuously the tendency to large-scale production — the International Harvester Company — has a machine whose sole work is to shape poles for wagons and harvesters. The machine cost \$2500; it saves a cent per pole; it is worth while only because poles by the hundred thousand are made each year.

Other causes, more or less closely connected with the growing

use of machinery, have strengthened the tendency to large-scale production. Just as all the several expenses for the plant and power become less per unit as the output enlarges, so the general expenses for administration and counting-room work tend to become less. Clerks are kept more continuously occupied, and more elaborate division of labor among them is feasible. Superintendent and foreman can take charge of the full number of men which each can direct to advantage. One watchman, one engineer, one timekeeper, can usually serve a large establishment as effectively as a small one. All the miscellaneous expenses of general management are less in proportion to a large output.

The mercantile management of a large enterprise — the buying of materials and the selling of the product — also offers opportunity for economy and efficiency. Supplies can usually be bought to greater advantage. This is commonly spoken of as if due simply to greater bargaining power on the part of the large buyer, and to greater pressure of competition among those who wish to sell to him. But in the main it is due to the fact that mercantile operations themselves, and especially wholesale operations, are carried on more economically when on a large scale. Expenses for clerical work, rentals of office premises, and the like, which constitute the main outlays of the wholesale dealer, are no greater for large transactions than for small. Hence brokers and wholesale dealers can sell at lower prices to those who buy habitually in large amounts.

Again, the disposal of the output is often less expensive per unit for a large establishment than for a small one, and often at still less expense for a very large establishment than for a moderately large one. Advertising and notoriety much affect the marketing of sundry commodities. When once appeal is made not to a limited local market but to a large and extensive constituency, the disposal of the great quantities of goods turned out by a modern factory becomes by no means the least difficult of its manager's tasks. All the apparatus for drumming up custom — traveling salesmen, trade catalogs, and the like — is the more effective, and the less costly per unit of product, in proportion as

it operates on a large scale. Advertising is most effective when spread over the land with every sort of device, when it is systematized and put in charge of a separate manager. All such elaboration of marketing is both a result and a further cause of a great volume of business.

The utilization of "by-products"¹ is another of the advantages of large-scale production. At the great packing houses which do so much of the butcher's work of the United States, every particle of the slaughtered animal is used, and many things which would go to waste in the small shop become a source of profit. A very large woolen factory finds it advantageous to utilize the fatty matter which is attached to the wool as it comes from the sheep's back. This grease, which must in any case be scoured out of the wool, goes to waste in a smaller establishment; whereas the large mill, by putting in a plant for the special purpose of treating the grease, finds it a source of gain. Great ironworks find it possible to utilize the gas expelled from coal in the coking process; either selling the gas, purified, in a near-by city, or using it at once for fuel in their own furnaces. A large sawmill can put in a plant for burning its own sawdust, dispensing with other fuel for power.

Other advantages of large-scale production arise from the possibilities of experimenting with new devices and new methods. Some ventures will fail, some succeed. In a very great enterprise, the successes may be expected in the long run to outweigh the failures; the enterprise insures itself, so to speak, against the inevitable risks of experimenting. Where the operations are conducted on a small scale, the failure of one experiment may ruin the entire undertaking. (Again, the best technical skill, the best-trained engineers and chemists, are more easily and more economically employed by the great establishment.) As with expensive but efficient machinery, their use is advantageous only for a very large output, and is most economical for the largest output.

§ 3. The limitations on large-scale production arise mainly from the infirmities of human nature. The extension of the scale

¹ Better, "joint products"; see Chapter 16, § 1.

of operations means an ever increasing reliance upon hired labor and an ever lessening reliance on spontaneous self-interest.) If all men worked with as much energy and spirit for an employer as they do for themselves, the spread of large-scale production would be almost without bounds. A striking illustration of the influence of this limiting factor is shown in the differing tendencies of agriculture and of manufactures.

The operations of agriculture are necessarily spread over a considerable area; and they are not easily subjected to a fixed routine. Both circumstances make supervision difficult. Manufactures, on the other hand, bring the concentration of hundreds or thousands of workmen under a single roof or in a small area. Moreover, in manufactures, machinery means the repetition of identical operations. Hence a routine can be fixed, and workmen assigned to fixed tasks, and their faithfulness controlled, with comparative ease. But in agriculture much must be left to the zeal and intelligence of the individual worker.

(The consequence is that agriculture has nowhere shown the same tendency to enlargement of the scale of production which is so unmistakable in manufactures.) It is true that some countries are usually spoken of as countries of large farming; England is the type of such a country. It is true, also, that in some parts of the United States (in the North Central region, for example), there has been in recent years a slight tendency to increase in the size of farms. But a farm which is called large is an industrial unit of comparatively small size. One which employs twenty men the year round is considered large; yet a factory employing this number is a small affair. The tasks of twenty men engaged in farming would be spread over several hundred acres, and must present troublesome questions in assigning and supervising the work. Farms of this size are comparatively rare. By far the greater part of agricultural work is done on farms where a single man, having under him perhaps one other or a few others, conducts the operations on his own account. In the early stages of the development of some parts of the United States, so-called "bonanza" farming appeared for a time. Where great level tracts of fertile

land were suddenly opened to cultivation, as in the interior valleys of California or in the Red River Valley of the Dakotas, wheat culture was carried on for a while over thousands of acres, with dozens of men and vehicles and with expensive machinery. But this proved only a temporary phase. As the fertility of virgin soil began to be exhausted, and a more varied and careful use of it was called for,¹ these great tracts were split up into smaller units. The head of a large factory can devise means for supervising his men and for securing the execution of his orders. But the owner of a farm can use hired labor to advantage only when his own example and his own oversight supply the needed stimulus.

{Some industries, tho spread over a large area and presenting difficulties for the supervision of hired labor, are so much more effective when on a large scale that these disadvantages are not decisive.] The railway is an example. Many of its employees are necessarily scattered over great tracts of country. The supervision of the innumerable agents calls for an intricate and expensive apparatus of rules and regulations, bookkeeping and auditing. But the work is done so much more cheaply on a large scale that this difficulty and the expense entailed by it are more than offset.

Sometimes, on the other hand, industries which offer possibilities of economy from large operations are for other reasons limited. (Tho retail dealings can be conducted to advantage on a large scale — with economies in purchases and in administration, with better utilization of premises, with more continuous activity by the force of salesmen — the smaller shops still hold their own. The opportunities for large-scale retailing are availed of in the cities by the so-called department stores; establishments whose growth has been immensely promoted of late years by the improvements in urban transportation. But even in a large city, and especially in its outlying quarters, small or moderate retail shops continue. The reason is that often the purchaser must have his source of supply near at hand. The ubiquitous corner drug store of our American cities persists against large competitors. An

¹ Compare Chapter 42, § 5.

innovation of very modern times is the chain of stores, combined under single management; but so spread about that each one is near its customers; necessitating an elaborate system of audits and accounts, which yet seems in this case not to be too topheavy.

A glance at such a volume as the *Statistical Abstract of the United States*, with its summary of the number of establishments and volumes of transaction in various kinds of business, shows instructively which among them, for reasons of this sort, resist the tendency of concentration. The strictly manufacturing establishments show the characteristic features of the modern movement. Tho the volume of transactions becomes immensely greater, the number of establishments becomes less. So it is with the manufacture of agricultural implements, of boots and shoes, of carpets, chemicals, firearms, glass, cotton, woolen and silk fabrics, sewing machines. In those industries which, like the retail shop, purvey more directly to the consumer, or for other reasons must be near the persons with whom they have dealings, the number of establishments increases in proportion to the increase in population and the volume of their own transactions. Such are blacksmithing, carpentering, plumbing, bread baking, printing, painting, and paper hanging. Here there is no marked tendency toward an enlargement of the size of the individual establishment, still less any victory of great-scale production.

The limitations of men's faculties explain why large-scale operations do not make their way, even in manufactures, with unfailing certainty. What has been said in the preceding paragraphs may seem to imply that the transition to greater size takes place quasi-automatically. This is by no means the case. It depends on the energy, ambition, insight, of individual men. Every new machine, every change to larger scale, involves risks, calls for planning and judgment, is dependent on some individual's initiative. If an indefinite number of individuals were capable of this sort of work, the march of progress would be faster and large-scale operations would make their way more surely and speedily. As it is, these changes wait on the impulse given by the comparatively few individuals who have the capacity for

industrial leadership. Occasionally some such individual reorganizes his business upon a larger scale and with more highly developed plant and machinery. Then others follow his lead, and a whole industry is rapidly transformed. This has happened during the last two decades in the iron manufacture, especially in the United States and in Germany. Carnegie in the former, Krupp in the latter, led the way in a remarkable development. Usually, however, the advance takes place by gradual and tentative steps, like those in the growth of the size of ocean steamships. The industrial revolution, so far as regards its pace, has been in reality not a revolution but a slow and gradual change, dependent on the energy and ingenuity of individuals and limited by the scarcity of men possessing such qualities.

(This human factor is usually ignored by the socialists and the constructors of utopias.) To them it appears that the increase of productive capacity is a simple matter, and simplest of all in manufacturing industries. Double or quadruple the scale of the individual establishment; shut up the small ones and transfer their workmen to those of large size — here is a ready way of increasing output and making matters easy for all mankind. It is part of the same utopian attitude that unending improvements in mechanical appliances are supposed to be an assured asset of the future under any condition of society. The fact is that great advances in the arts, whether they involve fresh invention or better management, or (as is commonly the case) involve both of these factors, arise from individual initiative, individual calculation, individual leadership. In a socialistic state, as under a régime of property, the question will be how men shall be induced to scheme and invent, to improve and to perfect their faculties to the utmost. What motives now move men so to open the paths of industrial advance, what other motives may conceivably actuate them under different social conditions — all this must be reserved for later consideration. But it is not to be supposed that under any organization of society there is a royal road to an increase of production.

§ 4. A new phase of large-scale production has come to be of

great and almost ominous importance during the present generation. Perhaps it should be called large-scale management rather than large-scale production; since it involves not so much an increase in the size of the individual establishments as the combination under single management of several establishments. It takes two forms, which may be described as horizontal and vertical.

Horizontal combination is the union under single management of a number of enterprises of the same sort. They are usually few, and each is usually on a large scale. As the size of the representative establishment in any industry enlarges, and the number of individual establishments shrinks, the stage is finally reached where but a few survive — a dozen, perhaps. (These then combine; not in the sense that one huge establishment supersedes the dozen, but that the dozen, while retaining their technical independence, are owned and managed as one.) The large-scale operation may have reached its limit so far as the mechanical apparatus of production goes, some gain may still be secured from united large-scale administration. A typical example is the American Sugar Refining Company. A modern refinery is a huge concern, costing a couple of millions of dollars, and putting out 10,000, even 15,000, barrels of sugar a day. Yet there are limits to its size. Beyond a certain point, enlargement no longer adds economy in operation. When an output beyond this capacity is called for, a second refinery of the same kind is erected, and so on until the total supply is provided. All these refineries, however, may be managed from one common center, with at least possibilities of economy. Their supplies may be bought in common, and distributed among them in such a manner as to insure continuity in operation and the minimum outlay for transportation. This last factor, economy in transportation, is of great consequence, where the chief material (raw sugar, in this instance) comes from great distances, and, being rapidly worked up, must be continually and systematically replaced. Machinery may be made identical, or "standardized," in the different works, and its repair and replacement thus facilitated. These and other possible economies

may be offset, to be sure, in whole or in part, by the inherent difficulties of large-scale management — notably the increasing difficulty of supervision. Experience, and especially the test of competition, can alone settle with certainty whether the advantages offset the disadvantages.

Horizontal combination is typical of the so-called "trust." The motive for such union under single management is two-fold. Partly it is to secure economy in management; but largely it is to put an end to competition and bring about a more or less effective monopoly. So far as economy is secured, the movement may be to the public advantage. But if monopoly develops, it has grave possibilities of public disadvantage. How far monopoly in fact is likely to result, and how far cheapening of production is in fact brought about, is still uncertain; time and experience alone can show. But it is clear that in some respects at least, and for some industries, such combination brings an extension of large-scale production and concentrated management.

Different in its essential features is vertical combination, or, as it is sometimes called, the integration of industry. The usual outcome of the division of labor has been that the several steps in production which succeed each other in time have been conducted in independent establishments. But in some important trades there has appeared a tendency to unite such successive stages under single management. Thus the iron industry, in the older form of organization, was split up into a number of separate branches. One producer — that is, a capitalist hiring and directing a group of workmen — carried on ore mining, and disposed of his ore to other producers engaged in smelting it into pig iron. Still another producer similarly cut the wood and converted it into charcoal — this in earlier days when wood supplied the fuel for iron making; or, after coke supplanted charcoal, mined the coal and made it into coke. The pig-iron maker, who had bought the ore and the fuel, sold his product to the puddler or steel maker, who in turn sold his bar iron or steel to the machinist, the builder, the wire maker. Vertical combination, or the integration of industry, appears when all these successive steps are united under

single management — when many of these phases of iron and steel making are combined in one great enterprise.

The United States Steel Corporation carries out this sort of combination in a typical manner, and on an enormous scale. Itself a union of previous combinations which had adopted the same method on a scale already great, this corporation owns vast mines of iron ore, of coal, and of limestone. The mines are situated chiefly on the shores of Lake Superior, the coal mines chiefly in Pennsylvania. Most of the ore is carried to the coal, and smelted in the great iron-making district of which Pittsburgh is the center; but in part the coal is carried north and west, meeting the ore, to be smelted at various places on the Great Lakes. To transport these materials, the corporation has its own railways in the Lake Superior region and in the region from Pittsburgh to Lake Erie; and it owns a great fleet of steamers and barges on the Lakes. The pig iron, made in its own furnaces, is converted into steel of various shapes in its own steel mills. The further operations of converting the steel into rails, structural and bridge shapes, plates and sheets, tubing, and wire, are carried on in still other establishments. In no other industry, and nowhere else in the world, has the experiment of vertical combination been conducted on so great a scale.

The iron and steel manufacture offers an unusually tempting field for vertical combination, chiefly, it would seem, because of the concentration of the supplies of raw material — coal and iron ore. Those who, at any stage of rising demand, possess the mines of coal and iron, have the whip hand in the situation; hence the manufacturers of the more finished forms of iron and steel have sought to gain control of the mines, by purchase or amalgamation. This tendency has shown itself in some degree in Great Britain, and has proceeded in Germany almost as far as in the United States. The combination of a series of superimposed establishments has now become the normal form of organization in the iron manufacture.

Some tendencies of the same sort are found in other industries. The International Paper Company owns great tracts of spruce

forest, cuts the timber and logs, floats them to its own pulp mills, and there manufactures the paper which is used in such enormous quantity by our newspapers. The Harvester Company, already referred to, owns forests and cuts timber; it owns its iron and coal mines, and makes its iron and steel. The Sugar Refining Company owns its forests and makes its barrels. Other industries have shown a similar development in another direction — in the marketing of goods. The usual arrangement is for a separation between manufacturing and marketing. The shoe manufacturer commonly sells his output to the wholesale dealer or "selling agent," who in turn often sells to an intermediate dealer, the jobber, and sometimes directly to the retailer. But some shoe manufacturers have undertaken not only the making but the marketing of their wares. They have established their own retail shops, scattered in many cities over the country, and thru these deal directly with the consumer. Again, the American Tobacco Company, by establishing its own retail shops in great numbers, likewise combined the distribution of goods and their production.

Vertical combination and horizontal combination may go hand in hand. The American Tobacco Company has attempted to combine all the establishments manufacturing tobacco for smoking and chewing; and the extension of its operations into the retail disposal of its products has been the outgrowth of the endeavor to form and strengthen this all-embracing horizontal combination. The Steel Corporation owns many iron furnaces, many steel mills, many tube works, many sheet-steel and tin-plate works, and thus exemplifies also the union of the two kinds of combination. The Steel Corporation has carried horizontal combination in some branches to the point of nearly complete monopoly; thus it owns virtually all the sheet-steel and tin-plate mills and tube works in the United States. But it produces little more than half the pig iron, and has by no means a monopoly of the steel rails or structural steel. In Germany, the *Stahlwerksverband* (Steel Works Association) has formed a compact pool in the iron and steel manufacture, tho one that does not go the full length of completely unified ownership. In Great Britain, on

the other hand, while many large works have extended their operations downward to the control of mines and upward to the making of finished products, there is very little of horizontal combination; the several great enterprises go their own way independently. In the case of the boot and shoe manufacturers, just spoken of, who own their own tanneries or sell at retail their own shoes, the combination is vertical only; there is no attempt at horizontal combination.

(The movement toward vertical combination is less strong than that toward horizontal combination.) The iron trade, which presents so striking a case of the former, is exceptional. The desire to secure control of a limited or at least concentrated raw material, which has promoted the integration of the iron trade, has not affected others, in which the sources of raw material are more scattered. In the manufacture of cotton, wool, silk, or flax, there is no indication of any movement for control of the supply of raw material or for vertical combination in any other way. On the contrary, the tendency seems to be rather toward a minuter division. The textile industries in Great Britain and on the Continent have always been split up into separate industries to a greater degree than in the United States. In Europe spinning, weaving, bleaching, dyeing, printing, are usually carried on as distinct industries. The tradition in the United States has been for the combination of several of these steps — especially spinning and weaving — into one organization; yet even here the movement of late years seems to be in the other direction. In the shoe manufacture, while there has been the marketing arrangement just noted, and in some cases a combination of leather tanning with manufacturing, the trend does not seem to be toward greater combinations. Some establishments make nothing but soles, others nothing but box toes, and so on.

(The movement toward combination, whether horizontal or vertical, is in part a result of the intensified competition which comes with the greater investment of fixed capital and the greater size of the separate enterprises.) But very largely it results from the discovery of the possibilities of organization. What

are the limits to the size of the enterprise which can be managed as a unit? The single factory or shop, perhaps large, was supposed until comparatively recent times to represent that limit. But as the scale of industry has been enlarged, the operations have been systematized and subjected to more perfect control. The task of management itself has been subdivided. Separate persons are intrusted with the purchase of supplies, the sale of product, the maintenance of plant, the hiring and superintendence of labor, accounting and auditing. The genius of men with great inborn capacity for business has led to ever greater perfection of organization. The telegraph, the telephone, improved postal service, have promoted large-scale management as they have large-scale production. These striking changes have been the results of skill, judgment, and administrative capacity in the guiding individuals, and also the cause of an increasing demand for the persons possessing such qualities.

None the less, the larger the scale of operations, the more do its disadvantages appear. There is need for an expensive system of control — for supervision, accounting, auditing, the effective prompting of energy and economy. The test of competition settles in the long run whether the great combination is the more efficient agent in production. If it can produce more cheaply, it can sell more cheaply and displace its rivals.¹

§ 5. Notwithstanding the wastes of competition, and the possible economies of large-scale production, competing establishments hold their own over the greater part of the field of industry. There is no present prospect that competition will be generally supplanted by combination and monopoly.

That competition operates wastefully seems in some cases obvious. The milk of a city, for example, is usually supplied by a number of dealers, each with his own set of customers scattered irregularly over a large area. If all who lived in a given quarter were supplied by one dealer, a clear economy in delivery would be secured. If the whole supply for an entire urban district were

¹ To this statement of the automatic action of competition there are some qualifications, considered in Chapter 65, § 3.

under single large-scale management, there would be a possibility of cheapening the product still further, and (what in this case is specially important) of improving its quality. Retail dealers, especially in such things as groceries and foodstuffs, overlap in similar wasteful fashion. Commonly, too, the areas supplied by competing manufacturers overlap. Advertising, again, seems to be in large part designed to induce a customer to turn simply from one dealer to another. If there were no competition — if one great establishment supplanted ten rivals — the same wants would presumably make themselves felt, the same purchases would be made, the expense of advertising eliminated, the goods sold cheaper.

Tho some tendency is seen toward getting rid of the causes of waste, the tendency is not very marked. With the growth of great cities, large firms and companies have come in great degree to control urban milk supply, yet with little indication that complete and systematic combination is emerging. The great manufacturing "trusts" endeavor to avoid cross freights, by making shipments from that one among their establishments which is nearest the point of delivery. But, as a rule, manufacturers continue to compete and to ship in a seemingly haphazard way. The same is true of retail trade, where all sorts of establishments, great and small, vie for the customer and duplicate facilities in the traditional and apparently wasteful fashion.

The waste is probably less than it seems. Competition keeps every one keyed to a high pitch, nerves the shrewd and alert, weeds out the inefficient. Advertising is part of the mechanism of competition as well as of combination. Not least, competition leaves the purchaser some freedom; he is not subjected to the alternative of either turning to one single purveyor or else doing without. Even the most benevolent and considerate monopolist often becomes exasperating; how much more so the ordinary trader when no longer spurred by competition! A choice as to what you would have, and when and how you would have it, satisfies a deep-rooted human instinct. In the advocacy of socialistic organization, the advantages of unified supply are much

dwell on. But the consumer in the socialist state would have to accept whatever the all-controlling public managers put before him. The satisfaction which comes from freedom of choice explains in large part the persistence of competition.

The movement toward combination has been so conspicuous of late years that the extent of the field which it covers has been exaggerated. Agriculture shows it least; transportation, especially by land, shows it most. In mining, there is the striking case of the iron trade; and there is also, in the United States, the striking case of anthracite coal, where the strictly limited area of supply and the ease of alliance with railways have brought about effective combination. Nevertheless, most mining is still carried on by independent producers. In manufactures, most industries have not reached the stage of combination. Over the greater part of the industrial field, the production tends to be on a larger scale, with great use of machinery and minuter division of labor, competition still prevails.

CHAPTER 5

CAPITAL

Section 1. Production is spread over time. This fact disguised by the division of labor. Increasing use of plant and machinery in modern times, 67 — Sec. 2. Producer's wealth and consumer's wealth; capital, 69 — Sec. 3. Capital rests on a surplus, 71 — Sec. 4. In what sense capital rests on saving. Hoarding contrasted with saving for investment, 72 — Sec. 5. Investment means advances to laborers. Inequality of possessions in relation to advances. Middlemen for investment and advances, 75 — Sec. 6. The maintenance of capital, as well as its creation, involves saving, 77.

§ 1. The increasing complexity of the division of labor and the growing use of machinery have added to the number of separate stages in production and to the length of time over which the whole process is spread. Hence the greater need of a supply of tools and materials, the importance of capital, the problems which relate to owners of capital and to the income from capital.

Production is spread over time in any society advanced beyond the most primitive savagery; and this not merely for the several subdivided steps in production, but for production as a whole. That agriculture takes time, from the sowing of the seed to the reaping of the crop, is obvious. But the sowing is not the beginning, nor is the reaping the end. The seed must have been itself sown and husbanded, and the tools for cultivation must have been prepared in advance. After the harvest, the grain which is reaped may indeed be available for satisfying human needs almost at once; it is so in a small, self-contained community, such as we still see in a village of Hindustan. But in the countries of advanced civilization grain is carried by rail or water to a mill, probably distant; there ground into flour; then carried another distance to dealers; and finally, after a considerable interval, put into the hands of the consumer. Each of these steps not only takes time in itself, but implies the existence of apparatus which

has been made in the past and has taken time to make — the railway or steamship, the flour mill, the warehouses and shops of the middlemen. Almost all the operations of production require first the procuring of materials from nature's resources, then their fashioning with the aid of tools and machinery. Let the reader but consider the mode in which the familiar articles of daily use have come into his hands — the clothing and the footgear, the furniture and household utensils, the books and ornaments, the house in which he dwells — and he will see how long has been the series of operations, how intricate the division of labor for each one, and how extended the period from the beginning of production to the final attainment of the consumable or enjoyable article.

This fundamental fact, resting on the complex division of labor, is yet disguised by that very division. The tanner who puts his leather on the market, the farmer who sells his flax, the ironmaster who sells his steel or iron, each thinks of himself as marketing a completed product. By the sale he gets money, and so the command of the enjoyable things he wishes to buy or of the things needed for continuing production. He never stops to reflect what must further be done to the thing which he sells; how it must pass through the hands of a long chain of producers and dealers before it reaches in consumable form those whose wants are finally satisfied.

In modern times, the most significant aspect of this element of time in production is found in the increasing use of machinery and plant of all sorts. Machinery, tho it may be simply a more intricate kind of tool, adds so much to the preparatory work that it has greatly accentuated the problems that arise from the spreading of production over time. A factory requires a year or years to build; the machinery in it requires still more time to make. Many years are needed for constructing a railway; a generation for such a work as the Suez Canal or the Panama Canal. The factory, and the machinery in it, exist for the purpose of eventually turning out things to be used and enjoyed. The railway and canal facilitate the geographical division of labor, and serve to promote, thru a series of steps which only begin when

these means of transportation have been completed, the eventual abundance of things to be used and enjoyed. One simple fact illustrates how marked the tendency toward greater use of plant has been in the period since the industrial revolution began. The world's annual production of iron has multiplied tenfold the last half century, and sixtyfold in the last century.¹ Iron is used solely (the exceptions are insignificant) as an instrument of production; it is the foundation of the material apparatus of civilization; it means plant, tools, machinery. The enormous quantities of it which have been turned out in modern times signify an extraordinary increase in the construction of elaborate and expensive apparatus, and a corresponding extension of time in the operations of production.

§ 2. If we were to take a cross section of the community's possessions at any given time, we should find them to be of the most diverse kind. There would be, in the first place, such things as iron ore and steel bars, timber and wool and cotton, factories and railways and ships, stocks of all sorts in warehouses, commodities ready for sale in the retailers' shops. And in the second place, there would be houses, furniture, clothing and food, in the hands of those using them for the satisfaction of wants. To the first set of things we apply the term capital, or producer's capital; the second set we call consumer's goods, or wealth that is not capital. The first set we may speak of as unfinished goods, the second set as finished and enjoyable goods. For some purposes of economic analysis they are similar, for other purposes dissimilar. The difference between them is essentially one of degree; yet is so great as to justify a distinction.² For the present, we shall find it convenient to apply the term "capital" specifically

¹ The world's annual output of pig iron was:—

In 1800	825,000 tons
In 1850	4,750,000 tons
In 1870	11,900,000 tons
In 1910	60,500,000 tons

² The difference in degree is one as to the time when satisfaction or utility accrues. That time is commonly nearer in the case of consumer's goods, and more distant in the case of producer's capital. See what is said below on these subjects, Chapter 40.

to the first set — to producer's capital. The second set will be referred to as enjoyable or consumable or finished commodities; and only when speaking of them in those aspects and relations which offer analogies to the first, shall we refer to them as consumer's capital.

Capital, then — that is, producer's capital — is not in enjoyable form; it is not now a source of satisfaction. It exists for the purpose of increasing consumer's wealth. Its relation to enjoyable goods is twofold. On the one hand, it may be said gradually to "ripen" into such goods. On the other hand, it is a means of increasing their supply.

It is easy to see that raw materials, as they are commonly called, ripen into finished commodities. Wool is converted by successive steps into clothing, grain into bread, stone and timber into a house. But a process the same in essentials takes place with tools and machinery. Suppose a printing machine to last for one year only, being worn out and worthless at the close of the year. The books printed with its aid are the product not only of the labor applied to making the paper and other materials, and of that applied by the compositors and other workmen in the printing office, but also of that applied in the construction of the printing machine itself. If we suppose that one hundred books are printed in the course of the year, the machine may be said to have ripened into so many enjoyable goods, and each of these may be said to have embodied in it one hundredth of the labor which was given to constructing the machine. The machine as such has disappeared, just as the paper and ink as such have disappeared; in place of all three we have the printed books. If the machine lasts for ten or twenty years, the labor of constructing it contributes to making a much greater quantity of books, and a smaller fraction of the labor of construction is embodied in each book. So of all machinery and all plant. It wears out sooner or later, and may be said sooner or later to ripen into goods that satisfy our wants.

The most important single cause of the abundance of consumable goods, and so of the improvement in the material welfare of mankind, is found in those forms of capital which are commonly spoken

of as fixed — in tools, machinery, plant. Certainly this has been the most important cause of the remarkable advance in material welfare which the civilized countries have made during the last century. Erect a great cotton or woolen mill, a shoe factory, a large sugar refinery or flour mill — take much time and apply much labor for getting ready an elaborate apparatus — and eventually you will secure your product in greater abundance, and with less labor embodied in each unit. The making of machinery itself has illustrated this tendency as strikingly as any other branch of production. The manufacture of iron and steel, conducted on a great scale, with elaborate and expensive plant, serves to turn out in cheapness and abundance the metal indispensable for the apparatus of production at large. Locomotives, textile machinery, agricultural implements, not to mention the simpler tools of the mechanic, are themselves made with machinery.

In order that all this application of plant may work smoothly and effectively, the supply of materials must also have been on a large scale; and this again involves prolonged preparation. A great iron furnace, kept in blast night and day, year in and year out, takes into its maw huge quantities of iron ore, coal, and limestone. These, no less than the furnace itself, must be made ready in advance. So the textile mill requires its wool or cotton or silk, the shoe factory its leather, the refinery its raw sugar. Thru all the complicated operations the trend is the same; elaborate preparation, production spread over time, much capital, eventual plenty and cheapness of the consumable goods.

§ 3. In order that there shall be capital and time-using production, there must have been at some previous period a *surplus*. The more of capital there is to be, the more must there be a surplus to draw on.

In the very earliest stages of the formation of capital, that surplus showed itself directly in the fact of spare time. The first rude implements of stone and bronze must have been fashioned during hours when labor did not need to be given for the satisfaction of imperative wants — when there was a chance of doing something else. What motives may have influenced

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L. 156 - 1957 - 127 - 128 - 129 - 130 - 131 - 132 - 133 - 134 - 135 - 136 - 137 - 138 - 139 - 140 - 141 - 142 - 143 - 144 - 145 - 146 - 147 - 148 - 149 - 150 - 151 - 152 - 153 - 154 - 155 - 156 - 157 - 158 - 159 - 160 - 161 - 162 - 163 - 164 - 165 - 166 - 167 - 168 - 169 - 170 - 171 - 172 - 173 - 174 - 175 - 176 - 177 - 178 - 179 - 180 - 181 - 182 - 183 - 184 - 185 - 186 - 187 - 188 - 189 - 190 - 191 - 192 - 193 - 194 - 195 - 196 - 197 - 198 - 199 - 200 - 201 - 202 - 203 - 204 - 205 - 206 - 207 - 208 - 209 - 210 - 211 - 212 - 213 - 214 - 215 - 216 - 217 - 218 - 219 - 220 - 221 - 222 - 223 - 224 - 225 - 226 - 227 - 228 - 229 - 230 - 231 - 232 - 233 - 234 - 235 - 236 - 237 - 238 - 239 - 240 - 241 - 242 - 243 - 244 - 245 - 246 - 247 - 248 - 249 - 250 - 251 - 252 - 253 - 254 - 255 - 256 - 257 - 258 - 259 - 260 - 261 - 262 - 263 - 264 - 265 - 266 - 267 - 268 - 269 - 270 - 271 - 272 - 273 - 274 - 275 - 276 - 277 - 278 - 279 - 280 - 281 - 282 - 283 - 284 - 285 - 286 - 287 - 288 - 289 - 290 - 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man during this stage, and by what chance the first tools were hit on, we cannot guess. Very possibly a mere instinct of contrivance was the moving cause. A reasoned understanding of the gain from having tools and supplies must have set in at an early stage. The choice under the simplest conditions is between the present and the future — between idleness or amusement for the moment and provision for future needs.

The greater the surplus, the greater the time and labor which can be given for future needs. When the arts are at so low a stage that little is produced beyond the bare necessities of existence, provision for the future can be made only on a scanty scale. On the other hand, the very scantiness of capital is an obstacle to the effectiveness of labor and so to the existence of any considerable surplus. During long ages mankind was thus in a position of double difficulty. Without capital the productiveness of labor was meager, and yet with meager productiveness of labor there was little possibility of creating more capital.

It is not to be understood that the slenderness of the surplus stock was the only obstacle to the creation of capital. Ignorance of natural laws and of the possibilities of tool making, carelessness of the future, were no less important. But without the surplus the very foundation for building up any effective apparatus of production was lacking. Here, as often, the first step was the hardest. Once man had become possessed of some capital, the productiveness of his labor became greater and thereby the creation of still more capital became easier.

§ 4. In the preceding section we have spoken of capital as being made or created. But capital is also said to be *saved* and accumulated. Both expressions are permissible. If we think of one person or set of persons as being alone concerned with the several steps by which capital comes into existence, we can see that this person not only provides for the future by saving, but also uses his surplus in shaping tools or getting together materials. But in a society having an elaborated division of labor, the two things are rarely done by one person; that is, they are rarely done together by one person for any given item of capital. A machinist

may save ; but there is no connection between his present savings and his present work on the machines. It is the previous savings of other people that made possible the materials and the machines as he finds them. When all incomes and expenditures take the form of money, savings are made not by putting aside things in kind for one's own use but by putting aside money for future needs. On the other hand, tools and other apparatus of production are made for the market by persons who are not consciously providing for the future. They are then bought by other persons who wish to "invest." The process by which these separate steps are made to bring about their joint result in the modern organization of industry deserves careful consideration.

Saving may take the form of simple hoarding. The miser who puts away a store of coin, saves and provides for his own or other's needs. But no addition to the apparatus of production results from such saving. Where property is insecure, from the rapacity of a despot or from the feebleness of a government unable to protect against foreign invaders, hoarding is sometimes done on a large scale. In British India, during many centuries preceding the British occupation, both these causes of insecurity existed. Hence persons who had means put them largely into the form of specie and jewels—articles having much value in little bulk and capable of being hidden or carried away. The European aggressors of the seventeenth or eighteenth century found great stores of such wealth in Hindustan, not because that country had rich mines, but because the people had attained a considerable civilization and prosperity, and had hoarded long. Notwithstanding the peace and security which British rule has long maintained, the habit of putting accumulated means into this form has continued in India to our own time. In France, for a long period preceding the French Revolution, the peasantry — those among them, comparatively few, who had anything at all in the way of a surplus — put away coins one at a time, hidden in the chimney or garret until enough had been accumulated to buy a scrap of land. Fear of spoliation and ignorance of other ways of doing anything with the money caused their saving to

take the form of hoarding. No addition to capital was thereby promoted. Nor was there any addition to capital even when the accumulated coins were brought out for the purchase of land. The noble of whom the purchase was made probably frittered away the proceeds, and the only immediate result of the peasant's accumulation was the transfer of land from one hand to another. Such practises continued in France after the Revolution and indeed thru the nineteenth century. The Franco-German war of 1870-71 and still more the Great War of 1914-18, leading as they did to enormous and widely diffused public borrowings, finally made a great breach in the peasants' habit of putting aside hoards of specie.

The great bulk of saving, however, takes in modern times the form of *investment*. Contrast the process of hoarding with what happens when money is put away in a savings bank—an operation which we may select as typical of the methods of investment in a modern community. The person who leaves his cash with the savings banks commonly thinks only that it is safe, and that he is paid something as interest on it. But the cash is not kept in the coffers of the institution. A small fraction only is retained, to meet possible calls of depositors who wish to make withdrawals. Almost all of it is lent out to persons who use it for making a profit. Now profit arises, in the ordinary course of things, from the operations of production; and the person who borrows money uses it for the purchase of things needed in production. He may be a manufacturer who erects a building, buys machinery and supplies, hires workmen. He may be a merchant who buys commodities from the manufacturer, and carries them one stage further in the successive stages which bring them at last to the consumer. Every person who directs production—such as the manufacturer or merchant—uses a large part of his means in buying materials or tools or stores from producers of a previous stage, so recouping them for the outlays they have already made. The money means which are put at the disposal of the business class as a whole are a most important part of the mechanism for adding to the concrete apparatus of production.

§ 5. The fundamental fact in this elaborate mechanism of saving and investment is that advances are made to laborers. One set of persons puts aside money means; thru various channels other persons are given command of these money means and use them to set laborers to work. Here, again, the division of labor between those who carry on the successive stages of production conceals the essential nature of their operations. A manufacturer spends only a part of his means upon hiring laborers directly; the rest he uses in buying plant and materials and in the other expenses of production. But those materials were themselves fashioned by laborers to whom another set of advances had to be made by a previous capitalist. The wholesale or retail merchant hires comparatively few laborers — only a set of clerks and a porter or two. But he recoups by his purchases of goods the advances of a long series of preceding employers, himself giving only the finishing touches in the whole process. Looking at the operations of capitalists and employers as a whole, and analyzing the outcome of the division of labor among them and their workmen, we find that all capital is made by labor, and all the operations of the capitalist class are resolvable into a succession of advances to laborers.

These advances, just spoken of as money turned over to laborers, consist ultimately in a provision of commodities for their use. The money is but the medium whereby laborers get command of the commodities which they buy. These commodities — things to eat, to wear, to give shelter — are in the last analysis what the employing class hands over to those whom it employs. Some of the advances were made in the past, and are represented now by plant and materials, still in use, of which the full equivalent has not yet been reproduced in finished form. Some are made from day to day, in the course of current operations. The whole of existing capital may thus be described as a great accumulated surplus which has been used and is being used for maintaining labor, while provision is made for the future. The process of setting laborers to work in the initial stages of production is going on all the time; similarly that of bringing articles to the final stage of consumable form.

The wide separation, in modern societies, of the two acts needful for the creation of capital — saving and the application of labor — is mainly the result of inequality. Persons of the well-to-do class have a considerable surplus over current needs, and save with comparative ease. They own most of the apparatus of production. But in our modern societies the great majority are not of the well-to-do class, and have little in the way of a surplus. They have small accumulations, and they are mainly hired by others in carrying on the operations of time-consuming production, and in making and maintaining capital. No doubt, some savings are made by the working classes; and thru the agency of savings banks and similar institutions, these savings have increased rapidly. But while absolutely considerable, they are no large proportion of the total accumulated means. The greater part of the capital owned and maintained in modern communities arises from the savings of the comparatively small number of the more fortunate classes.

A chain of middlemen commonly connects the individual who saves with the laborer to whom advances are made. The employer himself, tho he almost always uses some means of his own, commonly is a borrower. He borrows, however, not from the savers directly, but from their various agents and representatives. The savings bank, for example, collects surplus sums from individual savers, yet often deals with the employer of labor only thru brokers and other middlemen. It buys stocks and bonds from brokers and banking firms. The banking firms have issued them after long negotiations with the persons undertaking the operations to which the whole series of transactions is in the end directed. Bankers are the typical intermediaries; their essential function is to direct the stream of surplus money income into one direction or another, and to put into the control of one or another group of employers the means for setting laborers to work. Life insurance companies, which collect and equalize funds put aside by many individuals in order to provide for future needs, are among the great modern agencies of saving. Like the savings banks, they commonly make their investments not by direct

loans to employers, but thru bankers and other intermediaries who take the first risks of production and guarantee the investors a secure return. During the last half century there has been an immense increase in the amount of savings and investments by persons who themselves are neither desirous nor competent to direct actively the operations of production. Hence there has been a great development of the class of middlemen who intervene between them and the active managers; there have been great possibilities of profit for those middlemen, great possibilities of abuse in positions of trust, but also great effectiveness in collecting and investing the savings that underlie the enormous growth in the total capital of modern communities.

§ 6. Not only the creation of capital involves labor and saving; its maintenance does so also.

All forms of material wealth wear out in course of time. Some sorts of capital are indeed very durable, such as irrigation dams and granite docks. Some last a considerable time, as buildings and machinery. Others are used up very quickly, as the coal which is burned under the boiler. All need to be replaced as time goes on; some slowly, in proportion as they last long; some quickly, in proportion as they are rapidly used up. In order that the existing apparatus of production may be maintained, a certain amount of labor must steadily be given to its renewal and replacement. This labor must be supported, and its support means repeated demand upon surplus and savings.

The manner in which this takes place may be illustrated by the depreciation account which appears on the books of every manufacturing enterprise. The manufacturer knows that his machinery wears out, and that if his capital is to remain unimpaired, he must set aside something annually to replace it. Not only does his machinery wear out; in a period of rapid improvement and invention like our own it fast becomes antiquated, and he must be prepared for the possibility of having to discard it even before it has ceased to be workable. If we assume that its life is ten years, he must set aside annually something like one tenth of its value; to put it more exactly, he must put aside such

sums as, invested and compounded, will make up the value at the close of the decade. If he is to secure a permanent profit, he must reckon these amounts as part of his expenses. Yet, in the first instance, the amounts are so much surplus, available for expenditure, but not expected to be used for current expenses.¹ They are presumably used for purchasing new apparatus to replace that worn out; but they are not necessarily so used.

Commonly, capital is maintained intact; not in the sense that the same machinery or materials are maintained indefinitely, but in the sense that, as they wear out, other machinery and materials are regularly produced to take their place. The surpluses which are put aside to balance depreciation are again invested in the same enterprise and the same instruments, or in some other. The habit of saving is strongly intrenched among the well-to-do. Spendthrifts are rare, and such wasting as does occur is more than balanced by the fresh accumulations of new savers and investors. Consequently the making of new capital — of machinery, materials, and apparatus of all sorts — goes on constantly. The persons who in the established division of labor are engaged in the machine-making trades, have the well-founded expectation that the apparatus which they produce will be bought to replace that which has worn out. The manufacturer finds new machines already prepared. Under the division of labor, provision is constantly made for anticipated needs, and among those needs that of replacing of capital steadily makes itself felt.

The repair of capital, as well as its complete replacement when worn out, calls for the recurrent exercise of saving. Some kinds of apparatus must be touched up a little from day to day in order

¹ In practise, the actual setting aside of money, and its investment over a term of years as a separate fund toward depreciation, is probably rare. Usually, a sum is each year debited on the books against earnings, for depreciation. On the other hand, one or another item of plant is renewed or repaired each year — the whole does not become useless at one fell swoop — and the sums spent for replacement are charged against the depreciation account. In any given year, more or less may be actually so spent than is regularly set aside for depreciation. If less is spent, and the depreciation fund accumulates, it is often used, in a profitable enterprise, for putting in additional machinery or improvements — it is invested in the plant rather than for the plant.

to be in good working order. Such is the case with the roadbed of a railway, which needs almost hourly attention and would become quite unusable if neglected for a few weeks. The locomotive of a railway, again, is subjected to constant heavy strain, and needs to be sent to the machine shop at frequent intervals; until finally, after perhaps a generation of alternate using and patching, it goes to the scrap heap and has to be replaced with a new one. The continued maintenance of capital by operations of this sort means the steady application of labor hired — almost always, thru middlemen in a successive series — by persons who mean to keep their capital intact.

CHAPTER 6

THE CORPORATE ORGANIZATION OF INDUSTRY

Section 1. Partnerships and corporations. Limited liability. Corporations from the legal point of view and from the economic, 80 — Sec. 2. Advantages from corporate organization. Large-scale operations facilitated; new and venturesome investments promoted; stimulus to savings and investment, 83 — Sec. 3. Ease of transfer serves to divide risks and so promote investments, and to bring control into capable hands. But it leads to great evils: overreaching, stock exchange gambling, control by the unscrupulous, 85 — Sec. 4. Increasing importance of financial middlemen. Power of trusted bankers and managers, 89 — Sec. 5. High security of much corporate property makes the leisure class more permanent, 90.

§ 1. The growth of large-scale operations has caused a great development of combined action by producers and investors; that is, by those who guide production and those who own the apparatus of production. Association by the manual laborers themselves, for the conduct of production, is a different thing. It might conceivably be an important and even dominant form of industrial organization; but in fact it is not.¹ The form which is more important than any other in the modern world is the association in the business corporation of capitalist owners and managers.

The simplest form of association by such persons is the partnership of two or more persons. (The distinguishing mark of the partnership in the eye of the law was originally the joint and several liability of the partners for all debts; and this still remains in most cases.) Each of the partners is liable individually and without limit for all debts of the firm. A creditor, if his claim is not met according to stipulation, may levy on any one of them, and may secure the full amount of his debt from that one. The mode in which the partners then settle the distribu-

¹ See what is said, in Chapter 61, of coöperation by workingmen.

tion of the obligation among themselves is a matter with which the creditor need not concern himself.

The distinguishing mark of the corporation is limited liability. The several associated persons contribute to the undertaking, in the form of a subscription to shares or capital stock, a given sum. The liability of each for debts is then limited in proportion to his subscription. Usually it is limited to the precise amount subscribed. When they have once paid in that sum in full—the par values of their shares—they can be called on to pay no more. Occasionally there is a different liability. For example, in our national bank corporations, the liability is double; the shareholder may be called on to pay not only his original subscription, but (in case of need for meeting debts) as much more. Some limitation there almost always is. In the United States (almost without exception) a shareholder in a corporation is not liable, as is a partner, to the full extent of his means.

The legal distinction between a partnership and a corporation does not run parallel with that which is significant for the purposes of economic study. For the economist, the important distinction is between an association of a very few persons, well known to each other and actively engaged in the undertaking, and an association of a considerable number of persons, strangers to each other and generally investors not closely concerned with the management. Size, tho not necessarily significant, yet distinguishes roughly the two kinds of economic organization. It is true that many corporations are small, some partnerships large. But usually the conduct of operations on a considerable scale, and with a considerable number of participants, is in the corporate form; while partnerships usually confined themselves to more moderate undertakings.

During the last half century, legislation in English-speaking countries has greatly modified the sharp distinction which the law drew in earlier times between the partnership and the corporation. The strict rules of the older common law made the partnership a cumbrous form of organization. [It had to be wound up on the death of any partner, and it was in other ways

hampered in continuity of operation. Accordingly statutes have permitted partnerships to have some of the characteristics of corporations, — continuing existence, inactive members, some limitation of liability. On the other hand, corporations have been allowed to enter on all sorts of industrial fields which formerly were shut to them. Originally, industrial corporations were authorized only where some special public interest was supposed to be involved; as in the case of the great companies for foreign trade in the seventeenth and eighteenth century, of banking corporations, and, in later days, canals, turnpikes, railways, and the like. But the convenience of this form of associated action, compared with the cumbrousness of the partnership, caused a gradual extension of its field, until at present any and every sort of industrial enterprise may be conducted in corporate form.

The consequence is that many business corporations are of small size, owned and managed by a few individuals whose relations to each other are substantially those of partners. The choice between a corporation of this sort and a partnership of the older type is often determined by the peculiarities of the law in the place of action, by its tax methods, by its legal procedure. The fundamental distinction of limitation of liability has ceased to be of vital importance. It is true that a partnership with unlimited liability may be expected to enjoy better credit, since those who lend to it have more to fall back on. But credit in modern times depends very much on the personality and business repute of the borrowers; or, if there be question as to their business standing, it depends on the direct pledge of property. The other conveniences of corporate organization outweigh any disadvantage on the score of credit. Hence "Smith & Jones, Incorporated," or "Smith & Jones, Limited," or the "Smith & Jones Company," supersede plain "Smith & Jones"; but this change in the legal form of organization is of little economic consequence.

Very different, to repeat, is the economic significance of what we may call the true corporation. Here there are many shareholders, directors selected from among them, and managers

chosen by the directors — in other words, a clear separation between owners and managers. This is the sort of organization chiefly found when production takes place on a very large scale.

In our own time, and in the United States, many people associate with the term "corporation" something still different; not only divided ownership and large-scale operations, but special public importance. They think of corporations as having a monopoly power, and therefore peculiarly subject to public regulation. "Public service corporations" are spoken of as if they were *the* corporations. Whether there is a clear line of distinction between the so-called "public" corporations and the others and whether large-scale operations in themselves bring monopoly and public responsibility, will be considered in another place.¹ For the present we are concerned simply with those aspects of corporate development which have to do with the growth of large-scale production in modern times, and with the modern mechanism of saving and investment. Not only corporations of the "public service" kind, but others which are commonly regarded as having no special duties or relations of a public sort, present these aspects. Hence in the following sections we shall speak of "corporations" in the sense indicated above — those which operate on a large scale, which have many shareholders, and in which investors and managers are clearly separated.

§ 2. The advantages of the corporation for the development of industry have been great.

In the first place, large-scale operations have been facilitated. Many modern enterprises require so great a capital that no individual could supply it. In some of the older books on economics it was said that such enterprises could be undertaken only by the state; and hence mere size was regarded as a criterion for public management of industry. This reason for resorting to public management can now have no force. Tho no individual or small group of individuals be able to furnish the funds needed, the corporate combination of numerous individuals can supply the means for any undertaking, however large.

¹ See Chapter 64.

Limitation of liability has been a chief factor in promoting large-scale operations under corporate organizations. Every enterprise involves risk, especially in its first stages. Where the enterprise is large, the amount risked and the consequent liability are correspondingly large. If each individual who took shares were liable for debts, as a partner is, without a limit, investment would be checked. Occasionally it has happened that a great business, conducted in essentials under corporate form, but without the legal safeguard of limited liability, has met reverses and failed. Each shareholder has in such a case been subject to levy for all his property. Thus when the Glasgow Bank failed in 1878, hundreds of small shareholders in Scotland were ruined because each was liable for the debts without limit. Probably few of them were clearly aware of this possibility when they became owners of their shares. The general practise of strict incorporation and consequent limitation of liability had put them off their guard. If experience like theirs were frequent, it would not be possible to gather the capital for large enterprises by contributions from many scattered individuals.

Again, new enterprises, both large and small, and especially those which are large, have been promoted by the limitation of liability. The progress of invention in modern times, the diversification of industry, the increase of productive power — all this has taken place by successive ventures, each of which meant at the outset uncertainty and risk. It is comparatively easy to induce a person to take a few shares, or even a good number of shares, in a novel undertaking presenting possibilities of profit; but if participation involves also the possible loss of his entire fortune, he will be slow to join. Such a great risk will be taken only if the possibilities of profit be very great indeed; that is, if the prices of the commodity or service in question promise to be high enough to yield an exceptional profit. [Limitation of liability and consequent readiness to invest in venturesome operations mean not only that more such operations will be carried on, but that the community will get the output on better terms.]

Probably most important of all the ways in which corporate

organization has promoted the development of industry has been the ease of investment, and the consequent stimulus to saving and the making of capital. In the eighteenth century almost the only possibility of investing in securities was thru the purchase of public obligations; and these, tho they meant investment by the individual, usually brought no increase in the community's capital. Merchants and persons in active business could indeed manage the investment of their surplus means in factories, warehouses, ships, and the like. But the investor pure and simple could not turn to them. If he did not buy government securities, he had little choice except to buy and improve real property. Real property is not divisible into convenient shares, and involves a good deal of management and not a little risk. The modern security market, on the other hand, offers an almost limitless field for the investment of savings, great and small. Railways, factories, steamships, mines — all are conducted under corporate form, and corporate obligations representing them can be bought at a moment's notice by any one. [Savings have been made liquid, so to speak, and can flow with ease and in any desired volume wherever there is a prospect of their advantageous use.] The ease of investment in corporate enterprise has stimulated savings, and, by a reciprocal influence, the unceasing accumulation of savings has made possible an immense increase of real capital under corporate management.

§ 3. The consequences of ease of transfer for corporate shares deserve special attention. It is by no means essential to corporate organization; for conceivably those who have embarked as shareholders in a company might bind themselves to stick to it for good or ill. But transferability is so ancient and so nearly universal that it is commonly thought of as a natural and necessary part of corporate organization.

Transferability, like limitation of liability, is advantageous for the community in that it makes possible a greater division of risks. A person who has invested by taking shares in a given corporation is not thereby committed to the bitter end. If he does not think well of its prospects, or comes across some opportunity

which he finds more promising, he can sell his shares to another person who has a better opinion than his own of the original venture. As will be explained more fully in the later discussion of speculation and exchanges, ease of sale in any set of business dealings facilitates venturesome operations, and permits them to be carried on at a smaller margin of profit.¹ It is so with sales of securities and speculative operations on the stock exchanges. The essential advantage of such transactions for the public is that they operate as a sort of insurance against risk, and so stimulate investment, especially in new enterprises.

Transferability of shares probably has another advantage. It tends to bring ownership and control into the hands of the shrewd and competent. Those who judge best of the prospects of an enterprise and who exercise influence intelligently toward its skillful management, buy out those who are less capable. Good judgment is perhaps the most important quality for success in business operations, and tells immensely both for an individual's money-making and for the efficient utilization of the community's labor and capital.² Whether the reward which such judgment secures, often so large and so quickly won, is in proportion to the services rendered, is an open question. But judgment does tell immensely for the efficient conduct of industry, and transferability of corporate shares aids in making it tell.

Transferability, however, has had some consequences that are clearly not so beneficial. The sense of association for common ends has virtually disappeared among the shareholders of the modern corporation. Tho it persists more or less in the closely owned family corporation (the quasi-partnership), it is gone where the holders are many and widely separated. Each looks out for himself; deserts the venture in case of expected loss as a rat deserts a sinking ship, or, if he expects a gain, quickly gathers in from his associates a larger number of shares for his own profit. To sell out when the affairs of a corporation are going badly, to buy in when they are going well, is the height of business acumen.

¹ See Chapter 11.

² Compare Chapter 49, § 4.

This is quite inconsistent with the original notion of a joint venture for common profit or common loss; but it is not for a moment thought of as violating any principle of morals or of fair play. No doubt it brings the advantages just mentioned: the constant buying and selling lessen risk for the individual, and make for control by the shrewd and able. But it is among the phases of individualism that bring a shock to a nice moral sense.¹

The extraordinary growth of corporate enterprises and the transferability of their shares have brought into existence the modern stock exchanges, with all their conspicuous and sometimes overshadowing influences. The homogeneity of shares and other securities makes them available for purchase and sale by all sorts of persons, and thus peculiarly adapted for speculative dealings.² By far the greater part of the transactions on the exchanges have nothing to do directly with the process of actual investment; usually that has been completed before the securities are listed. It is only in the way of anticipation, thru the indirect influence of the prospect of easy transfer, that stock exchange dealings promote the increase of factories, railways, concrete capital. Tho the gain in this way is real, it is accompanied by a vast deal of unproductive effort in the way of stock gambling; nor is it easy to say whether the social gain on the whole outweighs the social loss. Most persons who discuss these matters have but hazy notions as to what constitutes the social loss or gain. They assume the corporate organization of industry as a settled fact, without discriminating wherein it is really to the general advantage. They assume transferability of shares to be a settled fact, without stopping to think whether the gain from quickened investment outweighs the material and moral loss from gambling. Still less do they consider whether the advantage from more efficient management at the hands of the shrewd outweighs the social disadvantage arising from greater inequalities in wealth.

¹ This disappearance of all sense of solidarity between shareholders is recognized frankly in the German practise of issuing certificates to bearer, as bonds are commonly issued; coupons being attached for such dividends as may accrue at stated dates.

² Compare again what is said below in Chapter 11.

Transferability often brings still other unwelcome consequences. Control passes not only to the shrewd, but to the unscrupulous also. The directors and other "insiders" who are best informed about the prospects of a corporation play the game with loaded dice when they buy from the ordinary shareholders or sell to them. This sort of action is not indeed sanctioned, as buying and selling among ordinary shareholders are, either by law or by general opinion. In the eye of the law, a director is in a fiduciary position. He is not allowed to profit from dealings with those whose interests he has in charge and is under obligation to disgorge any gains from such unfaithful doings. In the corporation of moderate size, whose shares are closely held, violation of fiduciary duty is frowned on by public opinion also. But in the great corporations the rigging of the market and speculative profit from inside information are not condemned with seriousness in business circles; and this largely for the reason that so many play the same game, or try to play it. The whole fry of buyers and sellers of stock are trying to over-reach each other. Those who fail lack only the shrewdness or good fortune, not the will, to get the booty. In stock exchange gambling, as in dicing and card playing and speculation in grain or cotton, it is the presence of a great mass of greedy and gullible persons that creates the opportunities for the comparatively few who are strong and shrewd as well as unscrupulous.

It is but just to add that corporate management has often shown a high regard for the duties of directors and officers, especially in the case of those companies of moderate size in which, as has just been said, public opinion is still strong in condemning bad faith. And almost invariably, even in corporations of the most miscellaneous ownership, the rights of the shareholder who is duly registered on the books are scrupulously respected. He gets the benefit of every accruing profit, of every windfall, however ignorant or incompetent he be in the details of management. This sort of regard for the shareholder indeed is a *sine qua non* of corporate investment. It is like the good faith of brokers in adhering scrupulously to bargains signified only by a nod of the

head, or a stroke of the pen on a sale-sheet. Without the assured maintenance of the mechanism for carrying on the agreed operations, the whole fabric of corporate investment would collapse. It is in the process of buying and selling, of becoming a shareholder, that there is play for manipulation. And here again it is sometimes difficult to draw a clear line between the exercise of good judgment and the abuse of official position.

§ 4. Another consequence of the growth of corporations has been the increasing power of financial middlemen. The investor has ceased not only to manage capital, but to use care and judgment of his own as to the use of his savings in creating it. The investment banks are the most important real directors of the course of investment. Such are the historic private banking houses of England and the United States — the Barings, the Rothschilds, the Morgans — and the newly developed large banking institutions of all modern countries, most conspicuous perhaps in Germany. From them "the public" buys its securities, chiefly the stocks and bonds of corporations. This purchase, much affected by the advice and repute of the financing bank, constitutes for the individual the act of investment. What corporations shall be organized, what industries carried on, what railways, mines, factories, equipped is decided by the financial middlemen, in consultation with the more immediately active managers of industry.

Hence the great power of those bankers who secure the confidence and support of numbers of investors. It is common to speak of the "control" of a given enterprise — a railway, a factory or combination of factories, a mine or complex of mines — as being in the hands of an individual or a few individuals; and the public is staggered by calculations of the hundreds and thousands of millions' worth of capital which are dominated by a Morgan or a Rothschild. Control of this sort does not signify necessarily or usually a concentrated ownership of those millions. It does signify concentrated power, based on the confidence which a multitude of investors have in the judgment and leadership of commanding personalities.

The concentration of control in few hands shows itself most strikingly in the United States. Tho we have been singularly reluctant to concentrate political control, we have been unhesitating in the acceptance of concentrated industrial control. It is odd that in England, where unification of responsibility has been carried to the maximum in public affairs (at least in the central government), directors still direct in industry, and the powers of presiding managers are still strictly limited. In the United States, where the tradition of checks and balances continues to shape political organization, directors in great corporations are often no more than figureheads, while presidents are benevolent despots.) This development of one-man rule has no doubt promoted boldness, efficiency, progress; but it has also concentrated power in a degree to justify uneasiness.

§ 5. Still another consequence of the development and refinement of corporate organization is an advance not only in the ease of making investments, but in the stability of the mere investor's position. The ingenuity of the financial middlemen in vying for the custom and support of the great army of savers has provided more and more secure ways of investment. All sorts of securities are offered; not only those with risks and with a possibility of large returns, but those with low return and absolute safety. Government securities still possess a special prestige as to safety and hence yield the lowest rate of interest. Corporate securities are also offered which are hardly less safe, and enable the purchaser to dismiss all worry about the maintenance of principal and income. The position of the property owner, if he is content with a low rate of return, is highly secure. It used to be said, and is still occasionally repeated, that the maintenance of a fortune calls for as much ability as the making of it; that riches have wings; that it is but three generations from shirt sleeves to shirt sleeves.) This is far from being the case in modern times. Chiefly as a result of corporate organization, a sort of abstract or distilled property has grown up, exempt from the vicissitudes of industry. The rich and the well-to-do, if they are content with low rates of return, can make their position almost

impregnable, and thru inheritance can maintain it indefinitely. A leisure class, based not on feudal privilege, but on savings, investment, and productive enterprise, has become a stable part of modern society.

CHAPTER 7

SOME CAUSES AFFECTING PRODUCTIVENESS

Section 1. The effect of high wages (abundant food) on the productivity of labor. High wages in the main a result, not a cause, of efficiency, 92—
Sec. 2. Effects of skill and intelligence on productivity. General education. Technical education, in its effect for the individual and for the community, 96 — Sec. 3. Leadership. The business man; the man of science. Freedom and mobility as promoting leadership. The motives to leadership, 100 — Sec. 4. The immaterial equipment of a community; how affected by training and by inheritance, 103.

§ 1. The preceding chapters have dealt with such causes affecting the productiveness of industry as the division of labor, the advance of large-scale production, the use and the growth of capital. Some other factors bearing on the efficiency of labor in production will be considered in the present chapter.

Among these other factors is the quality of the laborers. The increase of production depends not only on the marshaling and organization of the laborers and on their equipment with capital, but also on the strength and skill of the individual workmen. These two factors — strength and skill — may be taken up separately.

There is what may be called the steam engine theory of the efficiency of labor. It maintains, or perhaps implies rather than maintains, that the vigor of the laborer is in proportion to what he consumes. The more is turned over to him, the stronger will he be, and the more will he produce; just as the power got from a steam engine depends on the fuel burned in the fire box. Feed your laborer better, and he will be able to do so much more. It seems to indicate that it will always be profitable for the employer — at the least, consistent with the maintenance of profit — to pay higher wages.

There is a measure of truth in this view. It holds good particularly of the simplest unskilled labor, such as calls for contin-

uous and heavy muscular exertion. Sometimes men are so underfed that their physical strength suffers. Employers of large gangs of laborers find that it pays to feed them abundantly. Military operations which involve heavy labor, and especially those involving long marches, are more likely to succeed if the rank and file get good rations. Millions of people in backward and semi-civilized countries, such as China and India, are underfed. It is probable that their efficiency could be increased by more food and better housing. No small proportion of laborers in civilized countries are in the same situation. Mr. Rowntree, in his investigations on the city of York in England, made an estimate of the money wages which would secure, at current prices in England, the food, shelter, clothing, needed for physical efficiency. The sum was about 20 shillings a week for a family of five; and the earnings of one-sixth of the wage-earning class in York fell short of that sum.¹ The case is probably no less disheartening for many laborers in all parts of Europe; and, notwithstanding the higher general range of wages in the United States, there may be some workmen — perhaps but few relatively, yet in absolute numbers not insignificant — whose state is equally miserable in this country also.

It may seem that where laborers are underfed, an increase of wages up to the point of nourishment adequate for full physical efficiency will not be difficult to bring about, since the added product will make the added wages worth while. But the case is not so simple as it appears. Tho the laborers may gain in effectiveness from more ample subsistence, and tho the community may become thereby a healthier and happier social body, the individual who makes the advances to the laborers will not necessarily gain. If, indeed, the laborers were slaves, there would be some chance of direct profit from feeding them better. They would remain the property of the master, and he would reap where he had sown. Even as regards slaves, to be sure, it is not always profitable to go to the expense of full feeding. It may be cheaper to work them hard on poor fare, to wear them out in a few years,

¹ B. S. Rowntree, *Poverty: a Study of Town Life*, Chapter IV.

and to buy new ones for the same wretched round — a practise said to have been deliberately followed on some southern plantations in slavery days. However this may be, it is obvious that the case of free men is essentially different. The gain in effectiveness from better fare inures to the laborer himself. Any employer who would make the needed advances could have no assurances of recouping himself. The effects of full subsistence on effectiveness do not appear either with quickness or with certainty. The process is not quick, because time is needed to bring weakened and demoralized laborers into good condition. It is not certain, because some among them are so enfeebled by sustained hardship, or congenitally so weak in constitution, that they will ever become able-bodied. Even tho a body of underfed laborers, if taken in hand systematically, could be brought to a pitch of full vigor, the risks and uncertainties, as well as the probability that the regenerated men would betake themselves to employment elsewhere, make it hopeless for a profit-seeking employer to carry out any operation of the kind. It is only under exceptional circumstances, where large gangs of men are at work in out-of-the-way places and are therefore under a quasi-compulsion to stick to their job — say in building the Panama Canal or at construction camps in remote regions — that it is to the immediate interest of the employer to supply the means for ample support.

The class of underfed laborers, comparatively small tho it be in modern communities, presents a distressing problem. They are ill paid because they are inefficient; they are inefficient, for one reason, because they are ill-paid. Yet they are easily demoralized; too often they remain still inefficient if better paid from charitable funds. Neither physically nor morally do they respond readily to possibilities of improvement. Often the adults are hopeless; the children alone can be taken in hand with prospects of success. Hence even when there appears to be a case for increasing the productiveness of labor by adding to the reward of labor, the precise method of accomplishing the result is hard to devise. Only public or quasi-public action can grapple

with the problem; and this must include suppression or elimination of the unfit, as well as uplifting of the potentially capable.

All this reasoning and speculation, however, is concerned only with the minimum necessary for health and strength: the minimum, be it noted, for health and strength, not for keeping body and soul together. Men can live and do work for less than is necessary to enable them to do full work; the minimum for efficiency is above the starvation level. But when they once get what is necessary for complete physical vigor, anything in addition is mere surplus; surplus in that it no further increases efficiency. (If obtained, it must be as the consequence of skill and productiveness; it becomes a result of high efficiency, and ceases to be a cause of efficiency.) Nor is the minimum for full vigor a very high one. (An abundant vegetable diet, rude shelter, and simple clothing are all that a man needs in order to do the hardest work which the human frame can stand.) The frugal Italian or the rice-fed Chinaman, if only he gets enough of his simple fare, can do as much as the meat-eating Irish-American.

In some of the higher walks of life, the minimum for efficiency is doubtless to be measured more liberally. Something more is called for than that which is indispensable for muscular efficiency. The work of a lawyer, physician, teacher, business man, calls for alertness of mind and bodily health more than for physical vigor. The requisite response of intelligence will often be lacking if the surroundings dull the mind or enfeeble the spirit. (Hence as regards intellectual work we may count among the necessaries for efficiency varied food, ample lodging, restful relaxation.) It is hard to say just how far such sources of enjoyment, procured by a larger income, are really necessary for the best exertion of the mental faculties. Those who are accustomed to comfortable living and to pleasant distractions easily convince themselves that these are necessary to keep them fresh for their work. It is a sort of excuse, too, or justification, of the existing inequalities in income to believe that they are inevitable, in the sense that the work which earns the higher income could not be accomplished without the freer life which that

higher income secures. Yet plain living and high thinking are not incompatible. The luxuries and comforts to which most persons of the well-to-do classes are habituated could be in large measure foregone without loss of vigor or freshness. Some comfort, some leisure, some distraction, are doubtless necessary for the best intellectual work. But a modest income and a scale of expenditure much below that of most members of the well-to-do class would suffice.

§ 2. Different from strength are skill and intelligence. These tell strongly on the efficiency of the individual workman and on the productivity of industry at large.

Many of the improvements in the arts depend for their application on a good degree of intelligence. The Hottentot cannot use tools even of a comparatively simple kind because his brain power is not sufficiently developed. Negroes are employed in great numbers in the gold mines and diamond mines of South Africa, but for simple pick and shovel work only. For handling and guiding machines skilled and intelligent white mechanics must be employed. Many of the operations of agriculture require nothing beyond delving and ditching. But the fruitful agriculture of advanced peoples calls for care, discrimination, intelligence, and could not be practised by Indian ryots, perhaps not by Russian peasants. Many routine operations of modern industry can be carried on by any persons capable of giving steady attention. But that very faculty, like the ability and willingness to do prolonged continuous labor, is not a matter of course. It is not possessed by savages; it is a slowly acquired quality of civilized man. No doubt there is a growing range of machine work in which very slender intellectual or moral qualities are needed. In many factory operations of modern times, the human worker is hardly more than another steady and dependable automaton. Along with labor of this sort, however, there must always go some proportion of labor more flexible, more observing, more highly trained. This is the quality of mechanics' work, as distinguished from that of "laborers" in the narrower sense. Here accuracy, watchfulness, skill, intelligence, are called for; and here these qualities are indispensable for efficiency.

The effect of education on the productiveness of labor is not simple. In some respects, a wide diffusion of education is conducive to greater efficiency of the population at large; in other respects, the extension of education raises economic questions not so easy to answer.

The simplest kind of pick and shovel work seems to be done as effectively by the illiterate workman as by the educated. This is also the case, as has just been remarked, with much modern factory labor. And even in many handicrafts, book education is not indispensable for a high degree of skill. The work of the craftsman of the Middle Ages in Europe, and that of the same class of workers in modern Japan and indeed in some parts of contemporary Europe, show that illiteracy is no obstacle to the deftest use of tools.

Nevertheless, it remains true that (a wide diffusion of education is a most effective means toward productiveness.) It is effective particularly toward stimulating and diffusing new kinds of efficiency. When an art has once been learned by slow steps — for thus, historically, mankind has acquired most of the arts — its mere transmission from generation to generation, its maintenance and even perfecting, take place by the simplest imitation, unaided by book learning. [But the rapid spread and utilization of improvements are immensely promoted by the ease of intellectual communication. Mere ability to read and write opens at once a whole new world.] He who possesses it can learn from the experience of all mankind, no longer from that of his parents and masters only. The extension of such a great improvement as the system of interchangeable parts has depended largely on widespread elementary education. A complex tool or machine — a plow, a reaper, a bicycle, an automobile — is made nowadays on standardized patterns, each part being a precise duplicate of every other part made from the same pattern. When there is a break, the needed part can be replaced at once. The system makes possible the wide use of intricate apparatus in localities distant from repair shops. But its adoption is possible, in turn, only if those who are to use the apparatus have some general in-

telligence and if they can read instructions. In the United States the unexampled use of labor-saving agricultural implements, all made with interchangeable parts, has rested not only on the intelligence of the people, but on the universal diffusion of elementary education. The great industrial advance of Germany during the last generation is due in large measure to the same factors.

Technical education obviously has a direct economic effect. The training of civil engineers, mechanical engineers, electrical engineers, conserves from generation to generation the elaborate acquired arts. It promotes, too, the advance of the arts. In the past, great inventions and improvements have probably come as often from the workshop as from the laboratory. Under the conditions of the modern world, and especially with the more methodical application of natural science to the arts, the laboratory is likely to play a larger and larger part, both directly thru the inventions that come full-fledged from the laboratory, and indirectly thru the work of those who have had its training.

All training for the arts and professions tends to become more systematic in the modern world. The engineer gets his fundamental training, not in the workshop or in the field, but in the technological school; the physician or the lawyer gets his, not from the active practitioner, but from the professional school. The same movement is seen in the extension of industrial training to the familiar mechanic arts. Apprenticeship to a craftsman was for centuries the mode in which these arts were maintained and transmitted. But the conditions of modern industry have made apprenticeship ineffective and virtually obsolete. The "master" of former times has well-nigh disappeared; he is replaced by the large employer, out of touch with his individual workmen, whether young or old. Those preliminary stages of industrial training which were in former times provided by apprenticeship should now be undertaken by systematic trade schools, and should be a part of the general system of public education. The time is not distant when the normal entrance to a trade will be thru such schools, precisely as the normal entrance to the so-called liberal professions is thru their professional schools.

We must distinguish sharply between the effect of such education on individuals and on the community. As between individuals, the wide diffusion of educational opportunities has simply an equalizing effect. For the community, it tends to raise general efficiency; but it is not likely to raise general efficiency in the same degree as it raises the earnings of some individuals. It tends to break down any privileged position which may exist among those who now possess technical or professional skill. It may tend to lower their earnings. On the other hand it tends to raise the earnings of those who are enabled more easily to acquire such skill. [The trade unions are usually opposed to the establishment of trade schools, from a fear that it will lower the rate of wages in the more highly paid trades. This fear, tho much exaggerated, is not entirely without foundation. People who descant on the advantages of education, and especially of industrial education, often contrast the high wages of a skilled workman or trained engineer with the low wages of an unskilled laborer, and assume the difference to measure the relative productiveness of the two. They forget that if all men could easily procure the training for the better paid occupation, numbers in that occupation would be greater, and pay in it would be less. Wide and free diffusion of all sorts of vocational training would almost certainly increase the productive power of the community as a whole; but it would also tend to lessen the differences in earnings which now exist, and to lower the earnings of some individuals and some classes now favored.¹

[General education in all its grades, from that of the elementary school to that of the university, tho not directed to a clearly defined industrial end, doubtless has its considerable economic effects. True, it is largely an end in itself, or at least a means to other ends than industrial efficiency. The mere attainment of knowledge and understanding is a satisfaction in itself, to some persons a great joy.] Among man's traits none is more remarkable than his insatiable curiosity concerning all things in the heavens and the earth, and the satisfaction of that curiosity is one of the constant

¹ On this subject more is said below, in Chapter 47.

ends of human endeavor. And knowledge opens the way, it need not be said, to the higher and nobler enjoyment of life. But general education has its more immediate economic effects also. Tho reading and writing do not make the ditch digger stronger, and geometry and literature do not add directly to the skill of the mechanic, all education makes for intelligence, discrimination, the utilization of opportunities, the spread of improvements. It makes also for sobriety, honesty, and steady endeavor. The more it is directed to uplifting the character and training the faculties, and the less it follows dull routine, the more does it achieve these ends. Where it fails to achieve them, the remedy, even in the interest of bare industrial efficiency, is still not to curtail it, but to improve it.

§ 3. Not least effective among the forces that bear on productiveness is leadership. It is exercised by business managers, by engineers and technical experts, and by men of science. Economic efficiency is profoundly affected by the success of a community in securing good leaders.

When intricate tools and machinery are put together by skilled mechanics, and when all this apparatus is guided to its productive outcome by still other skilled mechanics, one is tempted to say that here are the real producers. But a little consideration leads to the inclusion with them of the designers — the inventors and engineers. It requires still further reflection to include also the directors and employers. These last, the business class, seem to some persons, notably to the socialists, to be mere exploiters. The real work seems to be done by the others; the business men sit by and merely levy toll. There is no greater misapprehension. The effectiveness of industry depends on the business man's leadership almost as much as that of an army depends on generalship. Under a complicated division of labor, the various factors of production must be brought together and properly combined. The different kinds of labor and capital must be applied to the best natural resources. The long gap between producer and consumer must be bridged. The skilled mechanic and even the engineer would commonly be helpless without the guidance of the business

leader. Especially is this the case where industry is rapidly shifting. Courage, energy, judgment, and command of capital are indispensable for economic progress. Much more will be said, as we proceed, on the significance of industrial leadership.

Another kind of leadership is that of the man of science. The progress of material civilization depends on the understanding of nature's laws. The astronomer, the physicist, the chemist, the biologist, lay the foundation for the development of the arts. Their efforts are usually stimulated in greater degree than with most men by motives of the higher sort — by the single-minded search for truth, or by love of fame rather than hope of material reward. The influence of scientific investigation on the arts, tho often indirect and unexpected, is none the less far-reaching. Faraday had no concern for the industrial possibilities when he discovered the induced current; yet how profoundly economic progress has been affected by the dynamo!¹

Leaders are rare. Most men are commonplace. Among the means for promoting progress none is more important than the discovery and stimulation of those who have high abilities.

Freedom of opportunity and diffusion of education are the means for discovering those possessing unusual gifts. Among the classes of men who now lack education and are depressed by illiterate surroundings, there may be many of talent and an occasional genius. To the general advantage of a wide diffusion of education is to be added the fact that it helps to arouse and develop all the gifted. It is probable, to be sure, that high inborn capacity is most common among those to whom education and opportunity are already open. We touch here on the debatable problem of the origin and significance of social classes. There is evidence tending to show that the well-to-do are in their more favored position because they possess on the whole higher intellectual ability. But the proposition, even if established, is subject to

¹ My colleague, Professor C. L. Jackson, has called my attention to Perkin's discovery of purple dye, which led to the aniline dye industry, and to the investigations of Graebe and Liebermann on alizarin, which led to the manufacture of that coloring stuff from coal tar; further instances of industrial changes consequent on the discoveries of pure science.

much qualification; and certainly it must be admitted that there is among the less prosperous some fund of capacity which fails to be utilized. Tho gifted persons are probably less common, in proportion to numbers, among the so-called lower classes, there may be many of them. The full development in these of all their qualities for better efficiency, above all for leadership, is one of the most important objects of widely diffused education.

Freedom and democracy operate to develop to the full the scanty number of leaders. The abolition of class privileges in modern times thus has been not only of political and social consequence, but has had direct economic effects also. The industrial preëminence of England during the eighteenth and nineteenth centuries was due largely to her free institutions. The lowborn person's opportunities to rise, even tho restricted, were better than on the Continent, and England profited accordingly. In the United States such opportunities have been more free than ever before in any part of the world, and to this factor, above all others, is due the wonderful material prosperity of the country.

Those possessed of the qualities for leadership must not only be given a free field; they must also be stimulated to the full exercise of their gifts. Inequality of some sort appears to be indispensable as a stimulus.

Obviously we have here a question different from those considered in the preceding pages. There is an essential difference between providing a gifted person with the wherewithal to enable him to do his best and offering him a reward which will stimulate him to do his best. [A reward in some way proportioned to the rarity and effectiveness of unusual faculties seems necessary to induce their exertion to the highest pitch.] Such, at all events, has been the experience of mankind with the gift of industrial leadership. No stimulus to economic activity has yet been found comparable in efficacy to that of the prospect of large earnings. Inequality of incomes and possessions, so far as based on differences in industrial efficiency, is a most potent instrument toward general efficiency in production.

This, to be sure, is the individualist view. It assumes that

most men are influenced in their bargaining and income-earning by preponderantly selfish motives. The extreme collectivist view is that men can be readily induced to the full application of their faculties by other than selfish motives. Neither view can be maintained without qualification. Some sorts of leadership are undertaken with little consideration of reward. Those having the very highest intellectual gifts in letters, in the fine arts, in pure science, exercise them in pursuance of a well-nigh irresistible impulse. On the other hand, industrial leadership and industrial efficiency seem to depend on industrial reward. Whether there are possibilities of stimulating them without inequality, or at all events without great inequality, is a question reaching into the most difficult problems of economics, and its full consideration must be postponed to a later stage.¹ Suffice it to say that material reward, in the shape of high income and the chance of a fortune, has hitherto proved wonderfully potent and apparently indispensable in eliciting and spurring economic leadership.

§ 4. In sum, the effectiveness of industry depends not only on material equipment, but also on what we may call immaterial equipment; not only on accumulated surplus in the way of capital, but on accumulated moral and intellectual qualities. Maintenance and transmittal are not less important for this immaterial capital than for the community's material capital.

Education transmits from generation to generation the acquired attainments of the race, from the rudiments of reading and writing to the most elaborate technical training. Not only these intellectual attainments, but moral qualities likewise, must be handed down to the successive generations. Habits of industry, truthfulness, honesty, sobriety, of consideration for others, of care for the common good — all these are of slow growth, and rest on repeated example and precept.

In some degree there is transmission also by inheritance. The biologists still differ on the question whether acquired traits are inherited. The more general opinion seems to be that they are not, and that only inborn qualities are passed on from parent to

¹ See Chapter 67.

descendant. If this be the rule universal in nature, man also must conform to it; and then some at least of the qualities that mark the civilized man can be maintained only by set training. Others perhaps have been incorporated in his nature by a process of selection — thru the weeding out, in the long course of history, of those having a less civilizable disposition. Human nature changes and improves, and the quality of men is now finer than it was thousands of years ago, perhaps than it was centuries ago. Repeatedly there are projects for hastening the process thru designs — by breeding men, as animals are bred, from strains deliberately selected. Without entering here on the far-reaching questions which such proposals raise, it may be said that, for a future as far as we can look into it, the slow and haphazard process of unconscious selection will alone affect the transmission and possible improvement of inborn qualities. As regards the general average of ability and character heredity leaves man, from one generation to another, on the whole *in statu quo*.

But persistent and repeated training not only keeps mankind *in statu quo*; it offers more immediate possibilities of advance. No less than inherited quality, it contributes to make the difference between the civilized man and the savage. Man's great moral, intellectual, educational capital must be conserved, like his material capital, by unremitting effort; and like that it can be increased by effort. In both ways, the effort is largely altruistic. It results from the cares and sacrifices of parents, and from the conscious endeavor of the community to improve the quality of all its members through the diffusion of education. But it results also in no small degree from the self-regarding motives — from the desire of each individual to better his own condition and that of his family. Certain it is that man now starts from a vantage ground which makes possible still further advance. (Some of his qualities for civilization he has inherited; others of these same qualities he acquires and transmits by constant effort.) The outcome of all is the great immaterial capital of the community; a possession not less important for the general welfare, and perhaps not less extensible, than his capital of tools and materials.

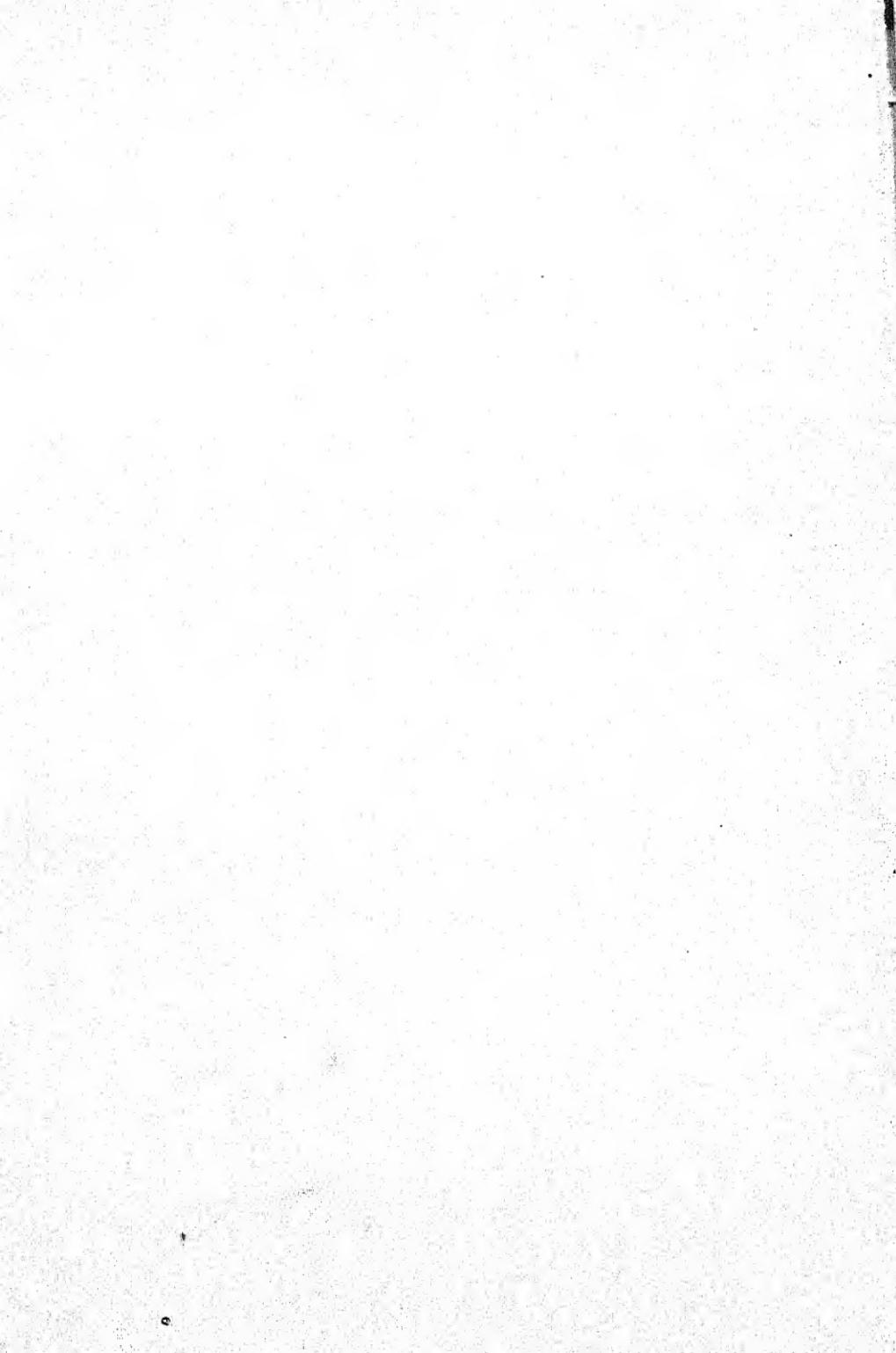
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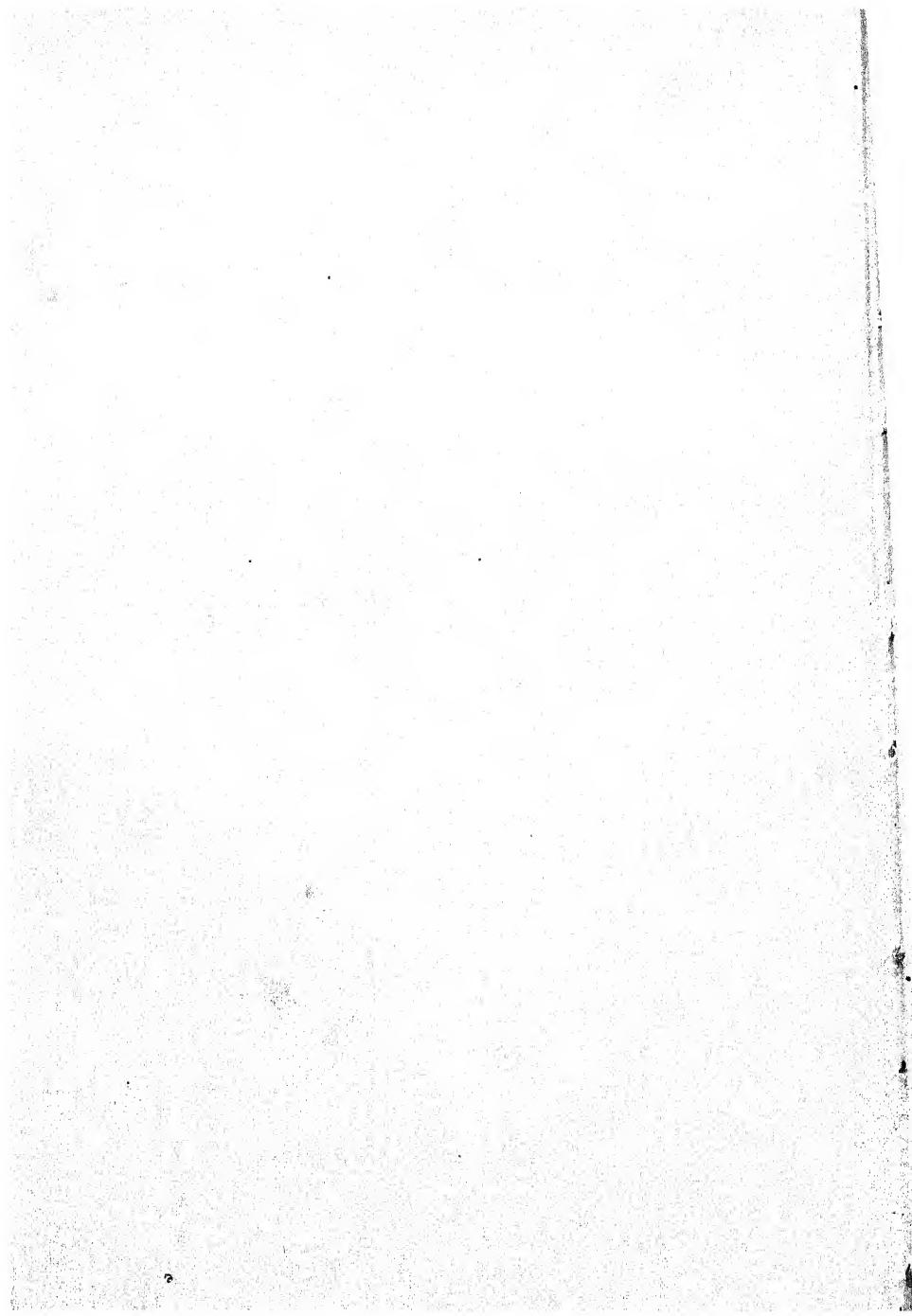
On capital, see the references given below, at the close of Book V. Much as has been written of late on corporate doings and corporate organization, I know of no helpful references on the topics considered in Chapter 6.

On horizontal and vertical combination, a good study, with special reference to British conditions, is by G. R. Carter, *The Tendency toward Industrial Combination* (1913).



BOOK II

VALUE AND EXCHANGE



CHAPTER 8

INTRODUCTORY: EXCHANGE, VALUE, PRICE

Section 1. Exchange the consequence of the division of labor, 109 — Sec. 2.
Money as the medium of exchange, 110 — Sec. 3. Value and utility.
The notion of value in exchange, 111 — Sec. 4. A general rise in values;
a general rise in prices. Stability in general prices provisionally assumed,
113.

§ 1. The division of labor brings in its train the exchange of goods between those who undertake the separated acts of production. Exchange in turn brings the phenomena of value, money, and prices. With these phenomena we shall be concerned in the present Book and in the Book following.

As has already been noted, the division of labor does not bring exchange as a necessary consequence.¹ There may be the self-sufficing patriarchal family, with a division of labor but without exchange; or its counterpart, the communistic society, self-sufficing at least to some degree. Even in the modern family there is division of labor, after a sort, between man and wife. But commonly we consider the family as a unit, and think of the housewife, when she works for husband and family, as working for that of which is she but a part. Similarly, the patriarchal family and the communistic society are regarded by their members as social and economic units. Exchange arises from a separation of interests and has grown with the growth of private property. Throughout by far the greater part of modern industry, division of labor prevails, and with it private property and labor for one's self and family. Hence exchange, and its concomitants, value and price.

Production for one's self holds its own longest in agriculture. Yet even in this industry division of labor and exchange are rapidly extending in the highly developed countries of our time. In the United States the self-sufficing farmer of earlier days has

¹ See Chapter 3, § 4.

well-nigh disappeared; and even the stolid peasant of Europe is being transformed by the modern methods of easy communication and ready sale and purchase. Tho the farmer still produces part of his own food, especially vegetables and fruit, there is a steady tendency toward widening the range of agricultural products which are bought and sold. Grain is sold by the individual farmer, flour is bought; cattle are sold, meat is bought; milk and cream are sold, butter is bought. In other occupations than agriculture the division of labor has worked out its consequences to the last stage. No labor is given to the direct satisfaction of each worker's wants by himself; all is turned to the indirect process of specialization and exchange. Hence sale, price, value, and the whole mechanism of exchange, become the characteristic economic phenomena.

§ 2. Almost as early as the division of labor, a medium for exchanging various products came into use. Barter — the direct exchange of products — may be carried on under a very simple division of labor; yet even then it is inconvenient, and as soon as the first stages of savagery have been passed, some use of a medium of exchange appears.

Any commodity which is in general use will serve passably as a medium of exchange. (He who has an article to sell, and cannot find at once the precise kind and quantity of the things he wishes to buy, will accept a staple commodity, with which sooner or later he will be able to procure the things he wants.) Hence in various stages of civilization the most diverse commodities have been used to obviate the inconveniences of barter.) In Homeric times the value of things was often stated in terms of oxen; for such occasional exchanges as are made among primitive pastoral peoples are naturally effected in terms of their staple commodity, cattle.¹ For a considerable time in the early history of the colony

¹ Mr. Wicksteed remarks (*The Common Sense of Political Economy*, p. 137) that "there is more evidence in the Homeric poems of the valuation of female slaves, of tripods, or of gold or brass armor, in terms of so many cattle, than there is of any direct transfer of cattle in payment of those goods.") It is probably true, also, of the other commodities mentioned in the text that they were used more freely for measuring relative values than for effecting exchanges.

of Virginia, tobacco was almost the sole article of export, and the chief commodity habitually produced for a market; it became the recognized medium of exchange in the colony. Furs, salt, tea, cocoa, have served the purpose with other people. But by far the most widespread among the things so used have been the precious metals, gold and silver. We need not pause at this stage to consider what qualities fit them peculiarly for serving as a medium of exchange — their luster and consequent attractiveness for ornament, their freedom from rust and deterioration, their homogeneity, their divisibility. Nor need we consider how the device of coining has increased their fitness for carrying on purchases and sales; nor in what ways paper representatives or substitutes for them have come to be so widely used in our own time. These are topics that belong to the subject of money, to which much attention must be given later.

It suffices here to note how completely division of labor and exchange work out their results thru the use of money. Every producer gets his return in amounts of money. The exceptions in any of the countries of advanced civilization are so few and are so rapidly disappearing that they serve only to make clear how virtually universal is the rule. Exchange takes place by first selling goods or services for money, and by then buying with the money such other goods and services as are wanted. The fundamental fact of exchange is thus obscured by the very mechanism that so perfectly facilitates it. Just as the coöperation and combination which are essential features of the division of labor are carried on without a consciousness of any combined action, so the process of exchange goes on without the consciousness that it is the aim and end of all buying and selling.

§ 3. The value of a commodity means in economics its power of commanding other commodities in exchange. It means the rate at which the commodity exchanges for others. If a bushel of wheat can be exchanged for a large quantity of other things — for many pounds of iron, many yards of cloth, many ounces of salt — its value is high; the possessor of it can procure many of these things. If a bushel of wheat can be exchanged for but

few pounds of iron, few yards of cloth, few ounces of salt, its value is low; the possessor of it can procure few of these things. It is immaterial that the exchange does not take place directly, but by the process of first disposing of the wheat for the medium of exchange — money — and then procuring with the money the iron, cloth, salt, or other desired commodities. The result of the double operation is the same as if the exchange had taken place by direct barter. Only it is reached by a more convenient method.

The value of a commodity, thus conceived, is its value in exchange. This is very different from its usefulness, or utility, or importance. In everyday discourse, we use the word "value" sometimes to indicate exchange value, sometimes to indicate utility or importance. We speak of the value of iron as greater than that of gold, and the value of wheat as greater than that of diamonds. We mean thereby that iron and wheat are more important, satisfy more urgent wants than gold and diamonds. Yet we also speak of gold and diamonds as more valuable commodities than iron and wheat; then we use the terms "value" and "valuable" in the sense of value in exchange, and mean that exchange and sale take place on such terms that with comparatively little gold and diamonds the owner can secure much iron and wheat. For the purposes of economics this latter sense, exchange value, is the more important.

A third sense, however, may be noted in passing. People sometimes speak of the "value" of a thing as greater or less than that which appears in an actual transaction of exchange. They speak of a house as being "worth" more than they paid for it, or of a commodity or a stock exchange security as selling for less than its "intrinsic value." They mean that the current price is different from the price that is likely to be paid in the long run, or different from the price which they think proper and just. In the sense which we have adopted, value means simply the actual rate in exchange, and there can be no value other than that registered by sales and exchanges. That the word is also used with this third signification, of proper or intrinsic worth, only shows

how vague and uncertain is everyday phraseology. Economists have often pointed out how much troubled they are, both in exposition and in their own thinking, by having to employ familiar terms, like capital and value, which in everyday use have various and shifting meanings. For the purposes of economics, one meaning or definition should be selected, and held to with care. In the following pages "value" will be used strictly in the sense which economists have adopted for it — a relation in exchange.

By the price of a commodity is signified the amount of money which it will command; in other words, its value in terms of the accepted medium of exchange. The notion of price is familiar, whereas that of value is one to which the beginner in economics must become accustomed. In modern times prices mean, in almost all advanced countries, the amount which is got, in exchange, of the particular money medium which these countries have adopted — gold. Paper and metallic substitutes for gold are often used, equal in exchange value to the gold, and performing the functions of a medium of exchange precisely as it does. The peculiarities of paper, silver, and copper as money will receive attention in due time. For the present we shall assume that gold is the medium of exchange, and that price is measured in coins of gold, say dollars. Coins, it needs hardly to be added, are simply pieces of gold manufactured with care and containing each a given weight of metal of uniform quality.

§ 4. From the definition of value, it follows that there can be no general rise in values and no general fall in values. Value is a term expressing the relation of exchange between commodities. If at a given time a commodity procures in exchange less of others than at an earlier time, it has fallen in value; but *pro tanto* those other commodities have risen in value. All cannot rise and fall together.) A change in the value of any one of them, or any set of them, means a converse change in the value of the rest. On the other hand, a change in general prices is not only possible, but is one of the familiar and recurring phenomena of economics. Wheat, iron, diamonds, things in general, may all exchange for more dollars now than they did ten years ago; and ten years

hence they may exchange for less dollars than they command now.

Evidently a general rise or fall in prices signifies a change in the value of money, that is, of gold. When all prices rise, and things exchange each for a greater number of dollars, the dollar can buy less than it did. Its power of commanding other things is less, and its value has fallen. When every single thing exchanges for a smaller number of dollars, that is, when prices have fallen, the dollar buys more, and its value has risen. The value of money is inverse to the level of prices. When prices are high, the value of money is low; when prices are low, the value of money is high.

The mere fact of a rise or fall in the price of a single commodity, therefore, does not indicate whether or no its value has changed. It may be that this single commodity alone has fallen in price, others remaining as before. In that case the fall in price registers also a fall in value. Or it may be that other commodities likewise have fallen in price to the same extent. In that case there has been a rise in the value of money, and a fall in the value of all commodities as compared with gold; but no other change has occurred in the values of commodities.

The value of gold, that is, the general level of prices, changes but slowly. The prices of individual commodities change quickly, all do not change quickly in the same direction. A rise in the price of any one is likely to be accompanied by a declining price of another, or by stationary prices of the others. So gradual are changes in the general range of prices, so uncertain the comparison and offsetting of the complex individual changes — a rise here, a fall there, no change at all in a third — that it is often difficult to ascertain whether during a short period a general change has really taken place. If, indeed, an upward or downward movement continues for years, it usually becomes unmistakable. We can ascertain then whether the value of money has risen or fallen, and can measure with some accuracy the extent of the change. But unless the lapse of time exceeds two or three years, it is often not easy to determine what has been the general trend; so stable are prices for short periods.

This stability of the general level of prices, it should be remarked, is by no means universally maintained. True, so long as the medium of exchange consists of gold and of other forms of money convertible into gold, there is ordinarily no occasion for qualifying what has just been said on this score. Yet even with a currency resting on gold, great and rapid changes affecting all commodities may take place in a short period of time — within a year or two; as was shown by the sharp rise of all prices in the United States during the Great War. Changes even more violent may occur when the gold basis has been abandoned and resort has been made to paper money pure and simple. These, however, are monetary phenomena, to be considered at a later stage. It is of the first importance to keep clear the distinction between the causes that act at any given time on all prices — monetary forces we may call them — and the wider and yet shifting forces that determine the price of one commodity compared with another. It is the latter that will be considered in the chapters to follow.

(The general prices and the value of money as a rule change but slowly, the prices of individual articles change quickly and considerably.) The price of wool or iron may rise by ten per cent in the course of a month; and changes are common in the prices of individual articles — of wheat, cotton, copper, coal — by ten, twenty, fifty per cent in the course of a single year. Where the price of one thing changes, other prices remaining the same, the new price evidently registers a change in value. The ordinary fluctuations in the prices of things thus signify corresponding changes in their values.

For the purposes of an orderly and systematic exposition of economic principles, we shall therefore for the present assume stability in general prices; hence that a change in price of an article signifies a change in its value. If an individual article rises in price under these conditions, it commands more of other things in exchange, and rises in value, and conversely if it falls in price. We shall thus use the familiar examples of price and money in our illustrations and figures, and shall put aside, for consideration at a later stage, the problems of fluctuations in the general level of prices.

CHAPTER 9

VALUE AND UTILITY

Section 1. Utility a necessary condition of value; but value not proportional to utility, 116 — Sec. 2. Increase of supply brings lowering of value; because of differences of means, and, fundamentally, because of the law of diminishing utility. Effects of varying the commodities supplied. Possible exceptions to the general principle, 117 — Sec. 3. Total utility and marginal utility, 120 — Sec. 4. Value depends on marginal utility. Qualifications and explanations. Marginal vendibility. The marginal utility of money, 122 — Sec. 5. Consumer's surplus. Sundry limitations on its significance and on the possibility of measuring it, 124 — Sec. 6. How state and measure the income of a community? 129 — Sec. 7. The law of diminishing utility points to the conclusion that inequality lessens maximum well-being, 132.

§ 1. An object can have no value unless it has utility. No one will give anything for an article unless it yield him satisfaction. Doubtless people are sometimes foolish, and buy things, as children do, to please a moment's fancy; but at least they think at the moment that there is a wish to be gratified. Doubtless, too, people often buy things which, tho yielding pleasure for the moment or postponing pain, are in the end harmful. But here, as has already been explained, we must accept the consumer as the final judge. The fact that he is willing to give up something in order to procure an article proves once for all that for him it has utility — it fills a want.

On the other hand, no less evidently, the value of an object is not in proportion to its utility.) Free goods, such as fresh air, pure water, the beauty of nature, may have high utility, tho wholly without value. Only slight value may attach to other things having high utility. In our advanced civilized communities the simplest and most wholesome articles of food have low value; they are cheap. Yet they satisfy the most elemental and pressing of wants, and have great utility. So it is of other necessities of life, as clothing, shelter, or warmth; great utility often

goes with low value. Again, some things whose exchange value is high have utilities which we do not ordinarily reckon great. Jewels, tasteless ornaments, a stupid book printed four hundred years ago — such things sometimes command a high price, tho the satisfactions they yield are not of a high order or apparently highly prized.

§ 2. The supply of a commodity, as we all know, closely affects its value. If at any given time an article becomes more abundant, its price falls; if supply becomes less, its price rises. The causes of these fluctuations are two, very different in nature and social significance.

One obvious cause, and that which many persons are likely to think of first, is the difference in means between rich and poor. Those who are able to pay highest, secure the first installments of any commodity that comes to market. If there be comparatively few installments, each will command a high price. As more and more are offered, the price must be lowered in order to bring them within the means of the less rich. Finally, if the supply be greatly increased, the price must be lowered very much in order to make purchases by the poor possible.

But the same result would appear if there were no differences between rich and poor — if all persons had the same incomes. Then also an increasing supply would bring a decreasing price. The principle which explains why the same inverse variation would appear under equality of incomes is that of diminishing utility; and this, the second cause, is the more fundamental, since in reality it underlies the first.

Consider any familiar article of daily use — the knives, forks, spoons, on your table, the clothing you wear, the house you live in. One set of knives and forks is essential to cleanly eating. A second set is highly convenient, a third somewhat less so; there is a decline in utility, until at last the stage is reached where an additional set is a mere encumbrance. So with clothing. One suit is necessary; a second and a third add to comfort. More and more can be used, yet with a steady tendency to lessening satisfaction from the successive installments. One room in a house,

or a one-room house, is indispensable for existence. The added comfort and decency from a second room are very great; and further additions to the houseroom continue to yield satisfactions. The rate of diminution in utility may be for some time comparatively slow, but the tendency still is present, and before long the stage is reached when more houseroom serves to satisfy only the love of display, not to yield substantial comfort. All things, it may be observed, which minister to the love of display, have the possibility of maintaining this sort of utility to a curious degree. The mere fact that a thing is rare — that it is of a sort not possessed by others, and so distinguishes its owner — gives utility to things otherwise useless; a notable example is an old postage stamp.¹ Additions to the supply of many classes of articles may for a long time give additional satisfaction, if the individual things be varied and adapted to gratify the love of distinction; as with the garments and houses of the rich. But the tendency to diminishing utility none the less persists. The addition of a new coat to an abundant supply, of a new room to a house already large, brings less satisfaction than the preceding coats or rooms brought.

To this general tendency we give the name of the law, or principle, of diminishing utility. Successive doses of the same commodity or service yield diminishing utilities. If the doses be continued indefinitely, the point of satiety will be reached. Their further repetition yields no satisfaction whatever; the utility of each additional dose becomes *nil*. This principle, as has just been intimated, and as will presently be explained further, applies in strictness only to units of the same commodity (or service). Vary the things supplied — even tho' it be made different only in small degree — then the result will not be quite the same. The diminution in utility may be prevented or checked, and the point of satiety may be indefinitely postponed. From the fact that there is a limit to the possibilities of satisfaction from increasing the supply of any one article, it is not to be inferred that limits in utility exist for all articles taken together.

¹ No doubt the instinct of acquisition (the "collecting" instinct) plays its part as regards such articles, in combination with the instinct for distinction thru display.

To put the general proposition in other terms: all enjoyments tend to pall if repeated. If any one of us were called on to retrench — to dispense with some enjoyments now possessed — he would find himself cutting off first those things least prized, and then in succession various others in the inverse order of their utility; a process which would make it clear not only that some things have more utility than others, but that some doses of the same thing have more utility than other doses of that thing.

It is this fact of diminishing utility that explains the growing variety in the articles produced and the growing complexity of production and consumption. As the productive power of mankind increases, and especially as the commodities in common use become more abundant, labor is constantly turned in new directions. It is given not so much to making more of the same things as to making different things. Abundance without variety means that the approach to satiety is rapid. Bread, in most civilized countries, is cheap, being produced with comparatively little labor. With increase in the effectiveness of industry, more and more bread could be produced with the same labor. But some of this labor turns to other kinds of food as bread becomes cheaper — to meat, eggs, butter, vegetables, fruit, sugar. A varied diet, such as is possible in modern times, marks a great advance not only over the monotony of savages' food but over the very restricted diet with which civilized peoples had to content themselves until the last century or two. The essentials of clothing also are plentiful and cheap, and a comparatively small part of the labor of a modern country is given to the covering needed simply for health and decency. A vast deal of labor is given to making more convenient and attractive clothing. Variety in production must take place if consumption is to respond.

There are articles to which the principle of diminishing utility does not apply as unfailingly as the preceding statement suggests. The stimulants on the whole show unquestionably the tendency to lessening response, the conscious effect from the first few doses does not always indicate it. The second or third glass of liquor may be as much enjoyed as the first. Or, to speak of higher things,

the second or third reading of noble verse, or hearing of beautiful music, often gives greater pleasure than the first. Again, there are many cases where a preliminary stage of doubtful satisfaction is succeeded, with habituation, by unquestionably greater satisfaction; as with tobacco and oysters. Many a novel article needs to be insinuated into people's liking. As this is brought about (perhaps by skillful advertising) the article reaches a stage where a larger supply of it is sold, not at a lower price per unit, but at a higher. In such cases, however, the tastes of the purchasers may be said to have changed in the interval; at any given stage of taste and popularity, the principle of diminishing utility will apply. It is not worth while to refine on the question whether in the cases just mentioned there are real or only apparent exceptions to the principle. The qualifications that may be needed are of no great importance. The tendency shows itself so widely and with so few exceptions that there is no serious inaccuracy in speaking of it as universal.

§ 3. From the law of diminishing utility we are led to the conceptions of total utility and of marginal utility.

Utility can be measured, for the purposes of economic study, in one way only: by the amount which a person will give to procure an article or a service. Enjoyment or satisfaction is subjective. The objective test of it is willingness to pay.) What a person will pay for an article rather than go without it, is the only test by which we can ascertain with any approach to precision how much satisfaction it brings him. (Hence price, actual or potential, is the economic measure of utility.) Not infrequently in discussion of this set of subjects it is said or implied that the utility of an article *is* the price it commands or might command. The language is inaccurate. Price simply *indicates* utility.

Consider now how price may measure the utility to an individual of several units of a given commodity — say five oranges. Suppose them to be offered in succession, each being appraised by itself without thought of there being more to come. The first we may believe to be so fragrant and refreshing that the in-

dividual would pay 50 cents rather than go without it. The second, yielding less satisfaction, would command only 25 cents; the third would command still less, say 15 cents; the fourth, 10; and the fifth, only 5. The total utility of the five would be indicated by the sum of the amounts which the several units would have commanded separately, namely:—

For the first orange	50 cents
For the second orange	25 cents
For the third orange	15 cents
For the fourth orange	10 cents
For the fifth orange	5 cents
For the total supply	<u>105 cents</u>

Suppose, now, on the other hand, that the five oranges exist as a stock, possessed together by the individual. All are alike. Take away any one, and the loss of utility or satisfaction will be the same as if any other had been taken away. Each has the same degree of importance for his welfare. As installments or successive doses, they have differing utility. But possessed as a stock, they have each the same economic importance. (Any one would be parted with on the same terms as another. And those terms — the price — would be settled by the utility (satisfaction) yielded by the *last* of them if they were enjoyed in succession.) The price at which the fifth would be bought (or sold) is the price at which any one of a stock of five would be bought (or sold). That price measures the *marginal* utility, or *final* utility, of the supply to this individual. (Economic importance; marginal utility; final utility; the satisfaction got from any one unit of a stock — all these expressions come to the same thing.)

It may seem paradoxical to say that all the constituents of a stock have the same economic importance, and that none the less some have greater utility than others. But there is no real paradox. It must be remembered that utility means satisfactions or enjoyments. To possess a stock is not to enjoy it (except so far as, by association of ideas, mere ownership gives pleasure; as in case of a miser's hoard). The stock is necessarily enjoyed, not as a whole, but by installments; and as it comes to be so

enjoyed, the successive installments yield lessening satisfaction. Economic importance is something different; it is the satisfaction dependent, not on the whole stock, but on any one of the constituents of the stock. Considered in this way, all the constituents are alike; even tho, considered as sources of enjoyment when actually used, they are of varying utility.

§ 4. Let us return now to the relation between the supply of an article and its price. In doing so, we pass from a consideration of the individual's satisfactions to those of a group of individuals; and thereby are brought to a consideration not only of marginal utility but also of marginal vendibility.

Increase in supply means lower price. It also means lessening utility from the added units. The price of a commodity depends, as the case is commonly stated, on the least of the utilities yielded by the supply, or on final utility; price, or value, depends on the utility of the last increment. Properly qualified, and properly understood, the principle is sound, and not only so, but of primary importance.

First as to the qualifications. The proposition is true, in strictness, only if we suppose many competing buyers and sellers. And in fact most things are brought to market by competing sellers, and are purchased by competing buyers. Assume now that a given supply, say 1000 oranges, is offered by the sellers. Among the buyers are some whose means are large, others who value oranges highly. Both sets would be willing to pay a high price for a few oranges rather than go without. But there are more oranges than these purchasers are eager for. To induce the rest to buy, or to induce the eager purchasers to buy more, the price must be lowered. As the sellers are many and competing, the price of the whole supply will be uniform. Any one seller, trying to obtain a higher price from the eager buyers, would be undersold by others. There would be one price at which the whole lot would go, and that would be the price which tempted the last buyer; or, to be more accurate, the last purchase by any of the buyers. (This last purchase, and the price which must be offered to induce it, would settle the terms for all the transactions.)

Next, as to the just understanding of the proposition. Observe that the last buyer and the last purchase have been spoken of, not the last or marginal utility. (In the usual statements of this fundamental principle of value, it is said simply that selling price, or exchange value, depends on marginal utility. The assumption is here tacitly made that all the buyers are in the same position and that all have the same means.) From this it would follow that a less sum of money paid out denoted a less utility, and that he who bought the last unit of the whole supply was not only the last purchaser, but the purchaser to whom that unit gave the least satisfaction. The fact is, however, that purchasers have very different means, and, as just pointed out, this circumstance is of vast importance in explaining the fall in price which actually takes place when supply is increased. (The dependence of selling price on the last purchaser (or the last purchase) is not affected by the inequality of incomes. But the significance of the final purchase for the utility or satisfaction-yielding power of the last installment of the supply is much affected.)

We may speak, therefore, of marginal *vendibility*. The common formulation by economists, that price depends on marginal utility, tacitly ignores the effects of inequality. (The term "vendibility" points to the dominant position of the price at which the last item is sold, and makes no implication concerning the satisfactions secured by the person who pays this price.) Marginal vendibility is the resultant of two forces, diminishing utility of successive units and inequality of incomes.) So far as concerns the immediate determination of price and the mechanism of supply and demand, it is not material which of the two happens in a given situation to be of most effect. The outcome is the same: increase of supply leads to a decline in price. But the social significance of price fluctuations and of the working of supply and demand is very different according as the one or the other is of controlling influence.

The simple and familiar fact that a rich man, when paying out a given sum of money, often gets less satisfaction than a poor man when he pays out the same sum, is expressed in more techni-

cal terms by saying that the marginal utility of money is less to the rich than to the poor. A dollar signifies little to the man of means. If he parts with it, his loss in welfare is vastly less than that of the poor man who parts with the same amount. A high price therefore does not necessarily indicate great utility to those paying it. It may signify only that the marginal utility of money is small.

The phrase "marginal utility of money" must, however, be used with caution. Money has utility in a different way from other things. (It is valued not because it serves in itself to satisfy wants, but as a medium of exchange, having purchasing power over other things.) Gold jewelry is subject to the law of diminishing utility precisely as other things are. But gold coin—money—is subject to it only in the sense that an individual buys first the things he prizes most, and then other things in the order of their smaller utility. Strictly speaking, the statement that money has varying utility and that there is a marginal utility of money is only a way of saying that the things bought with money have varying utility, and that some among them are at the margin of utility.¹

§ 5. The conceptions of total utility and marginal utility lead to that of consumer's surplus.

(Consumer's surplus is the phrase applied by Professor Marshall (who has done more than any other writer to make clear this whole subject) to the difference between the sum which measures total utility and that which measures total exchange value.) The total exchange value of a set of goods is obviously the price per unit multiplied by the number of units. But the total utility of the units as they come to be enjoyed is a different quantity. Thus, our orange-eater would have been willing to pay for the first orange 50 cents, but had to pay only 5 cents. He had a "surplus" of 45 cents' worth of satisfaction. Using the same figures as before for the supposed supply of five oranges, we get the following comparison between the prices that would

¹See what is said further on this topic, and on the peculiarities of the value of money, in Chapter 18.

have been paid and the prices that were paid in fact; the difference indicating consumer's surplus.

	POTENTIAL PRICE MEASURING TOTAL UTILITY	ACTUAL PRICE	CONSUMER'S SURPLUS
For the first orange . . .	50	5	45
For the second orange . . .	25	5	20
For the third orange . . .	15	5	10
For the fourth orange . . .	10	5	5
For the fifth orange . . .	5	5	
For the whole supply . . .	105	25	80

The case is stated here in the simplest terms, and on the assumption that the price of this small supply of oranges would be determined as is the price of the usual large supply of commodities as they come to market in the actual world — by the price which carries off the last increment. Without stopping now to inquire how far this assumption in fact holds good where a very few commodities are put on sale,¹ let us consider the nature of consumer's surplus, as here typified.

How substantial is this surplus? and how far is this mode of measuring it satisfactory? To ask these questions is only to ask, in different words, how substantial total utility is, and how far we can measure total utility.

One limitation of the first importance has already been indicated when considering marginal utility and its connection with demand. If all persons had the same income, then willingness to pay a given amount for an article might be fairly assumed to mean that the article had the same utility for each of them. But some have greater incomes than others; the marginal utility of money is less to the rich; and the payment by them of a larger sum does not signify a higher utility. Price depends — to use the phraseology suggested a moment ago — on marginal vendibility, not simply on marginal utility. A rich man will pay for hothouse fruits or vegetables a sum quite out of the question for a person

¹ See the next chapter, § 9.

of modest means. The latter may secure, at a season of greater plenty, precisely the same things for a price much lower. The rich man probably gets no greater enjoyment from his expensive purchase; or, if so (counting as part of his pleasure the gratification of the love of distinction), by no means in proportion to the higher price he pays. If some of the familiar comforts of civilized life became scarce—fresh milk or good bread—they would command a high price, even if all persons had the same incomes. But the price would go still higher if there were a circle of persons able and ready to bid heavily for them without making serious gaps in their incomes. The special increase of price resulting from this latter circumstance is indicative, not of specially high utility, but of large means for purchasing utilities.

Still another qualification is suggested by the fact of inequality. Many articles which command a high price satisfy the passion for display. Such are the precious stones, rare paintings, and statues. No doubt many things of this sort—the great works of art—are intrinsically beautiful, and yield enduring and unalloyed pleasures; and it is their intrinsic beauty, tested by time, that is at the basis of their high value. Yet since they are rare as well as beautiful, they satisfy also the deep-rooted instinct of emulation and desire for distinction. They have what has been called a prestige value. They command a higher price simply because they are already high in price. Suppose now that such things became common and therefore cheap; that diamonds, for example, became very plentiful, and that their price fell to some such level as that of glass beads. The intrinsic qualities of diamonds would remain: their luster and brilliancy, their hardness. The satisfaction which the previous limited supply had given might be thought, therefore, to remain undiminished. Yet in fact it would be vastly diminished; for diamonds would no longer be evidences of wealth and social station. Consumer's surplus, as measured by the previous high price, would evaporate.

Consumer's surplus is thus unsubstantial for a considerable range of articles much esteemed and paid for at high prices. Not only the favorite objects of rich collectors, such as rare paintings

and books belong in this class, but many others which are not commonly thought of as belonging there. Handsome houses, fashionable clothes, even choice food, get no small part of their power of yielding utilities from their satisfying the sense of distinction. As to all these, total utility and consumer's surplus are highly elusive.

Another qualification concerns articles at the other end of the scale — things of simple necessity. Measured in terms of the prices that would be given for the early doses, consumer's surplus is very high for bread, clothing, houseroom — for the minimum of food, raiment, and shelter. Rather than dispense with these, anything would be given; life itself depends on them. Total utility and consumer's rent may be calculated to be infinite. Certain it is that, were they to become very scarce, their price would go to a very high range; and this irrespective of whether there were or were not inequalities of incomes among the purchasers. But a question may be raised as to the nature of the utilities derived from necessities. The satisfaction they give is of a negative sort. The chronicler of Lewis and Clark's expedition across the American continent narrates that at one stage the explorers subsisted on dried salmon in the form of a tasteless powder, so unappetizing that only the absolutely necessary amount was eaten. Some such situation is in the mind of an ingenious and stimulating thinker, Professor Patten, who has distinguished between a "pain economy" and a "pleasure economy." The first phrase describes that economic stage in which the efforts of man suffice only to yield the indispensable minimum; to prevent hunger, thirst, freezing; to ward off pain, not to yield satisfaction. The second describes that better stage when the first elemental wants have been attended to and positive enjoyment begins; when food is appetizing as well as sufficient, when clothing and houseroom are attractive.) Now in reckoning total utility and consumer's surplus we do well to begin only when this second stage has been reached. Let those utilities which are of the indispensable sort be set aside. Only where the stage has been reached of possible comfort, of some choice in the direction of

expenditure, can there be anything in the nature of a real surplus of satisfaction for the consumer.

This is true not only of absolute necessities, but in a good degree of conventional necessities. Equipages and horses are conventional necessities for many members of the Continental aristocracy. They would be immensely missed if the individual had to give them up. Yet the real enjoyment from them is doubtful. So it is with the starched linen and close-fitting clothes of the well-to-do, which are insignia of the wearer's exemption from manual labor. The satisfaction from them is chiefly negative; their loss would be more keenly felt than their presence is enjoyed.) Positive satisfaction is indicated in very uncertain degree by the price which under the stress of convention the individual would pay for such things rather than do without.

Not the least of the difficulties in the way of measuring utilities by potential prices is the practical one that we have no means of knowing what prices would be paid for the several installments of a commodity if they were offered one by one. In our illustrative case it has been assumed that the first orange would be so greatly enjoyed as to command a price of 50 cents. But in hardly any actual case do we know what price would have been fetched by the first installment or by a series of earlier installments. All we know is that they would command much more than that settled by marginal vendibility for the actual supply. We have some information (tho not very much even here) regarding the variations of prices in the neighborhood of the range familiar to us.¹ We observe how oranges, cigars, bread, meat, sugar, go up and down as the quantities become somewhat greater or less than those usually put on the market. But we have no precise knowledge of what would happen if the quantity were to vary greatly from the usual amount. Statistics of prices, however perfected, throw no light on the very high range that would be paid if supply became very small.

These accumulated difficulties make it impossible to measure in any precise way total utility or consumer's surplus. The figures which have been given for illustration are useful in making

the conceptions clear, but are misleading in that they imply accuracy of measurement. We cannot set down the complete price schedule; and even if we could, the differences in incomes, the illusiveness of prestige, the doubtful satisfaction of a pain economy, combine to render a calculation of real enjoyment impracticable. We cannot measure with any approach to accuracy the satisfactions got from wealth.

None the less, total utility and consumer's surplus are not fanciful. That they are real is shown by their accord with familiar phrases. We often say that we get a thing for less than it is worth to us, meaning that what we give for it offers less satisfaction than the thing we buy. This is merely stated with more care and precision when we say that a consumer's surplus is secured. Tho that surplus may not be clear either at the lower end of the scale of consumption, where bare necessities alone are bought, or at the upper end, where mere vanity is satisfied, it is unmistakable in regard to what may be called the true enjoyments of life. A varied diet, abundant houseroom, clothing and fittings that permanently please the taste, the gratification which all get from the mimic arts, distraction coming after monotonous work, the pleasures of the intellect — these are things not less enjoyed when abundant and cheap. They often have a utility much greater than is indicated by the price of them. Tho their utility be not susceptible of measurement, total utility is certainly large and consumer's surplus is correspondingly large.

§ 6. The discussion of utility, total utility, and consumer's surplus leads to another question, How state and measure the income of a community?

An individual usually thinks of his income, and measures it, in terms of money. So long as the prices of commodities and services remain the same, this mode of estimating income is for most purposes sufficient. The condition stated — of stable prices — is obviously important. If all money incomes double, and all prices also double, the community is no better off than before. It simply conducts its exchanges with a different scale for the medium of exchange.

Hence we proceed naturally to the next step. Money income is significant simply as a way of measuring the quantity of the things which the money buys. We may think, therefore, of real incomes in contrast to money income — of the necessities, conveniences, and luxuries of life. We must reckon, also, as part of real income, the services of those who used to be called "unproductive" — actors, musicians, servants, and so on. The more we can get of such "real" income, of all kinds, the more prosperous we are as individuals and as a community.

But we may go a step beyond. We have seen¹ that production consists in the creation of utilities. Now, just as all production in the last analysis consists in the creation of utilities, so all income consists in the utilities or satisfactions created. Economic goods are not ends in themselves, but means to the end of satisfying wants. In a preceding chapter, we have distinguished between capital and wealth which is not capital, or (in other phraseology) between consumer's wealth and producer's capital. (But consumer's wealth, which we may treat in one sense as "real" income, is an instrument no less than producer's capital.) It too is a means, not an end. Our food, clothing, furniture, may be said to yield psychic income. They shed utilities, so to speak, as long as they last. In the final analysis, the income of an individual or of a community consists of the sum of utilities steadily accruing from its store of goods and services. It consists, that is, of the total utility of all.

Nevertheless, for almost all purposes of economic study, it is best to content ourselves with a statement, and an attempt at measurement, in terms not of utility but of money income or of real income. The reason for this rejection of a principle which is in itself sound lies in the conclusion just reached regarding total utility and consumer's surplus: they cannot be measured.

The other ways of stating and measuring income lead to results of some certainty. We can measure money income. Tho our statistics for the total money income of (say) the people of the United States are far from complete, the task of ascertaining that

¹ See Chapter 2, § 2.

income is not hopeless. Indeed, it has been accomplished for some countries with sufficient accuracy. We can also measure the general range of prices. We know, therefore, whether a given sum of money incomes at one time means more than a given sum at another time. If we know that money incomes have increased, and that the range of prices is unchanged, we are sure that real income, in terms of consumable commodities, has increased.

Further, we can do something toward measuring "real" income directly. We can ascertain what has been the consumption per head of population, at different times, of such articles as flour, sugar, tea, coffee, cotton, wool, and the like. The results give significant indications regarding the increase of income in terms of commodities. We know that the average consumption of such things has much increased in recent times, and that material welfare has so far advanced.

But how far total utility or "psychic income" has increased, we have no accurate notion. We may feel sure that it has increased in some degree; but whether in the same degree as consumer's wealth, or in less, or even in greater, degree,¹ we do not know. We cannot measure how great total utility was before the increased supply of economic goods, or how great after. The supply of the things which minister to enjoyment can be measured, but not enjoyment itself. Virtually all problems of legislation and applied economics can be settled, and habitually are settled, according to the results in terms of the former sort of income. Hence we do best, for almost all economic reasoning, not to go beyond the tangible and measurable facts of consumer's wealth. Even tho consumer's goods be but a sort of capital, and even tho the total utility be in the last analysis the true income, the only kind of income about which we can reach results of quantitative accuracy is that "real" income which consists of enjoyable things.

¹ If we accept the distinction between a pain economy and a pleasure economy, and begin to reckon total utility and consumer's surplus only when a surplus over necessities appears, we may conclude that for a considerable stage after the first emergence of a surplus, total utility increases in greater degree than consumer's wealth.

§ 7. The principle of diminishing utility, if applied unflinchingly, leads to the conclusion that inequality of incomes brings a less sum of human well-being than equality of incomes, and that the greater the inequality, the less the approach to the maximum. If additional increments of any commodity yield less enjoyment than preceding increments, the same is true of increments of income in general. A man who already has five oranges gains less from a sixth than he who has but one orange gains from a second. A man who has an income of \$10,000 gains less from an additional \$100 than does the man who has an income of \$1000. This is stated in another way in the proposition that gambling between persons of equal income always brings an economic loss. If two men, each having \$1000, bet \$100, the gain to the winner from the increase of his possessions to \$1100 is less than the loss to the loser from the drop of his possessions to \$900. All this follows directly from the hedonistic calculus — from the principle of diminishing utility.

We have just seen that the hedonistic calculus is not to be applied unflinchingly. It needs to be qualified, for example, in its application to the necessities of life — to pain economy and pleasure economy. Additions of income (that is, of goods purchasable) which come after the first needs of bare existence have been met, may mean not only an increase of well-being but a more than proportionate increase. Hence if one half of a people have a considerable surplus over necessities, and the rest the bare necessities only, the sum of enjoyments may be greater than if all had the same income — if the surplus were spread thin over the entire mass.

And it hardly needs to be said that the hedonistic calculus, even where it does lead clearly to the conclusion that enjoyment is subject to diminishing return, does not tell the whole story of human happiness. One of the unfailing sources of satisfaction, deep-rooted in human nature, is the response to the instincts of emulation and distinction. But distinction implies inequality. Tho there may be distinction and inequality in other ways — in rank or fame — difference in economic possessions has been

an immense stimulus and an immense resource to almost all men. Much of the spice and flavor of life would be gone with flat equality.

None the less, it remains true that there is an opposition between inequality and maximum happiness. The opposition becomes obvious when there is very great inequality. High disparity of incomes means a net loss in enjoyments; the rich gain less than the poor lose. That some emulation and distinction be essential to a full and happy life, and that some inequality of income be a natural consequence of distinction, such great inequalities as are familiar in modern society, and indeed in all societies advanced much beyond barbarism, cannot possibly bring the most effective distribution of the material sources of enjoyment. Emulation in ostentation palls; it is the least lasting of all the satisfactions derived from distinction. The consciousness, more or less obscure, of the inconsistency between maximum well-being and great inequality underlies the whole modern social movement; for essentially this movement has for its goal a more equal distribution of income. From this flow the characteristic tendencies of our time — curbing of monopolies, extension of government industry, labor legislation, progressive taxation; last but not least, socialism. (Inequality may be, and probably is, an indispensable spur to the full application of men's best faculties, and an inevitable outcome of free and vigorous industry.) But *prima facie* it does not lead to the best distribution of well-being. It is always on the defensive; and the greater and more lasting it is, the more difficult is its defense.

CHAPTER 10

MARKET VALUE. DEMAND AND SUPPLY

Section 1. The conditions of demand and the demand curve, 134 — Sec. 2. Demand possibly discontinuous, usually continuous. Elastic and inelastic demand, 136 — Sec. 3. How value is determined by marginal vendibility, for a fixed supply. The equation of demand and supply, 140 — Sec. 4. A varying supply: the equilibrium of demand and supply, 142 — Sec. 5. How far the supposition of a fixed supply, how far that of a varying supply, conforms to the facts. The circumstances that act on daily and on seasonal prices, 144 — Sec. 6. Qualifications as to the market value of capital goods, 148 — Sec. 7. Retail prices seem to follow wholesale prices, but in the end govern wholesale prices. The advantage of fixed retail prices, 150 — Sec. 8. Current market prices are what people commonly mean when they speak of "fair" prices, 153 — Sec. 9. Sporadic cases where value is affected by utility to sellers, 153.

§ 1. In the preceding chapter the first principle of value has already been stated. The value of an article depends on its marginal vendibility. It is the price at which the last installment can be disposed of — the price that settles, in turn, under the ordinary conditions of competition in the market, the price at which the whole supply will be sold. It remains to illustrate this principle further, and to explain in what manner it operates in the complexities of actual life.

Let us first illustrate the main principle graphically. On Figure 1, prices are measured along the perpendicular axis OY ; quantities, *i.e.*, the several installments offered in the market, are measured on the horizontal axis OX . Let it be supposed that the first dose, say of sugar, is represented by the horizontal line OA , and that this dose would command the price OP . Its value would then be indicated by the area $OPA'A$ — the quantity multiplied by the price. Suppose now a second dose to be offered, indicated by the line AB . Under the influence of the principle of diminishing utility, its price would sink to OP' , and the whole supply would now be sold at this price (or rather, as will presently

be explained, at no higher price than this). The total value of the increased supply would now be indicated by the area $OP'B'B$. Add now another dose, the supply being OC ; the price sinks again, and the value of the whole supply is $OP''C'C$. And so on, with the supply OD , the price will be OP''' , and the whole value $OP'''D'D$, and with the supply OE , the price will be OP'''' and the whole value $OP''''E'E$.

Strictly speaking, under the conditions here assumed, we should not know that the price for the quantity OB , for example, was fixed at the amount indicated by the lines OP' or BB' . We should only know that it was not higher than OP' and not lower than OP'' (CC'). In order to induce the supply OB to be taken off, the price must be at least as low as OP' ; otherwise, the buyer would not take it. But if the buyer offered less than OP' , the

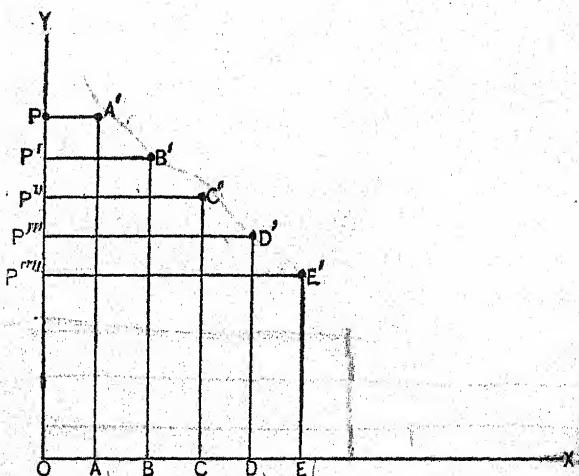


FIG. 1.

seller would still rather dispose of his supply than have it left on his hands; and until another potential buyer came on the scene, there is no telling what price the seller might not accept. But if another buyer comes, to whom the dose has the utility measured by OP'' , and who is willing to pay the price so meas-

ured, the seller can compel the second buyer, stationed at B , to pay at least as much as the third competitor, stationed at C , would offer. Price, therefore, would be somewhere between OP' and OP'' , or somewhere between BB' and CC' . So in each of the successive stages. The price must be at least low enough to tempt the last buyer who must be called in to dispose of the whole supply offered. It may go a bit lower than this, until the point is reached at which a new buyer would enter and prevent the more desirous buyer — the more "capable" buyer, as he has sometimes been called — from beating the seller down. If there be a considerable difference between the utilities of the installments to successive buyers, there is a considerable range within which price is indeterminate.

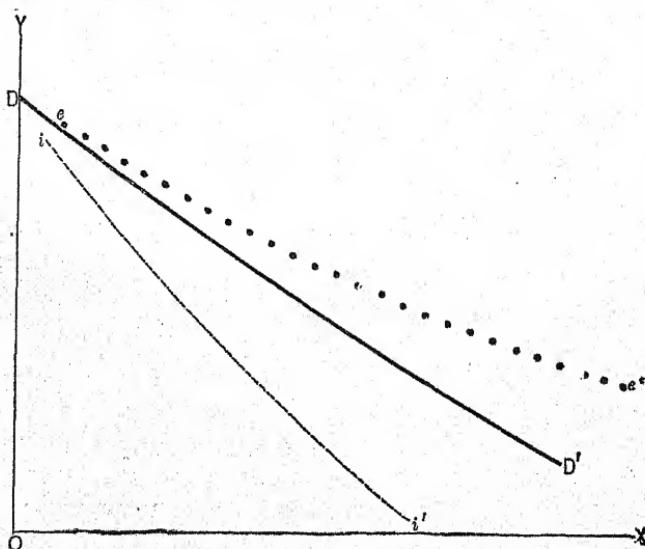


FIG. 2.

§ 2. We have already noted, however, that in the ordinary course of business dealings there are no such abrupt stages in demand as the preceding diagram assumes. There are not a paltry half-dozen purchasers, and a few pieces on sale, for any given article.

There are many buyers, to whom great supplies are offered. Among the many buyers, there are always some just ready to step forward; some to whom the utility of the additional dose is only a shade less than was the utility of the previous dose, and who are therefore called into the active purchasing market by the lower price.) This situation is described, in the technical language which economists have found convenient, by saying that demand is continuous. Where there are gaps between the utilities to different purchasers, and consequently between the prices they are willing to pay, demand is discontinuous. The successive steps from A' to B', C', D', E' in Figure 1 indicated such discontinuity of demand. The nearer together these points are, the smaller is each step, and the less is the range within which price is indeterminate. For the immense majority of dealings in modern communities, the points are so near together — the gradation of utility and demand is so close — that they may be represented as joined into a line or curve. That curve, on a diagram such as is commonly used in graphic illustrations of these principles, always has a smooth downward inclination from left to right, like the unbroken line DD' in Figure 2. It indicates that successive doses of any article have gradually diminishing vendibility, and must be offered at prices that insensibly become lower and lower as greater quantities are disposed of. It is called the *demand curve*.

The shape which that curve assumes indicates the nature of the demand for the commodity. If it descends slowly — as does the dotted line ee' in Figure 2 — it indicates that, as greater quantities are offered on the market, new purchasers appear readily and the decline in price is slow. The demand for the commodity is then said to be elastic. On the other hand, a curve descending quickly, like the broken line ii' , in Figure 2, indicates that utility or purchasing power diminishes rapidly, that new purchasers do not readily appear, and that the decline in price with increasing supply is abrupt. In such a case the demand for the commodity is said to be inelastic: consumption does not respond promptly to a lowering of price.) The cause of inelasticity

must be, in some degree, rapid diminution of the utility of added installments; but this cause may be accentuated by inequality in means. If some purchasers are very rich, others well-to-do, many others poor, commodities may meet a highly inelastic demand in the market, but not necessarily suffer a corresponding diminution in their power of yielding enjoyments to mankind.

The difference between elasticity and inelasticity of demand, as it has just been described, is one of degree only. If we were to use the term "inelastic" in strict accord with its ordinary connotations, we should say that demand was inelastic only when the quantity purchased remained the same whatever the price. The demand curve would then be a perpendicular line. And we should say that demand was elastic if the quantity purchased increased even to the slightest extent as price declined. Since every commodity (the exceptions, as already stated, are negligible) is bought in somewhat greater quantity at a lower price, the demand for every commodity would then be elastic. In this meaning of the term, there are degrees of elasticity, but inelasticity of demand never appears; the demand curve is never a perpendicular line.

It is convenient, however, to use the terms in a less rigid sense, and to indicate by them differences of degree — to indicate that with some commodities the response of purchase and consumption is more pronounced than with others. The dividing line between "elasticity" and "inelasticity" is then placed at the stage where, in technical language, the elasticity of demand is unity. Imagine a commodity for which the same identical sum is always spent by purchasers. The quantity purchased does indeed increase as price falls, but increases in such proportion that the quantity multiplied by the price always yields the same product; and conversely, while the quantity purchased becomes less as price rises, the diminution is such that at the higher price per unit the total spent still remains unaltered. To this sort of case we apply the phrase that the elasticity of demand is unity. Compare such a commodity with one of which the quantity purchased increases greatly as price declines — so greatly that the total spent at each several stage is greater than at the preceding stage. Elasticity

of demand is then greater than unity. Conversely, if there be still another commodity of which the quantity purchased, tho it increases as price declines, increases so slightly that the total amount spent at each several lowered price becomes actually less than at the preceding stage — then elasticity of demand is less than unity. Elasticity of demand in the first case was greater than unity, in the second less than unity. It is convenient to give precision to the difference of degree by speaking of the first sort of case as showing an elastic demand, of the second as showing an inelastic demand.¹

The demand for necessities is inelastic. Nearly the same quantity of bread will be bought, whatever the price. No doubt a high price will in some degree check consumption, and a low price will lead to more liberal or careless use. But when the indispensable supply has once been got, the decline in utility from greater quantities is rapid. For articles of this sort, a comparatively small shortage in supply will cause a large increase in price, while a comparatively small redundancy will cause a rapid decline. The sharp inclination of the demand curve *ii'* is the graphic representation of the inelastic demand for necessities and of the abrupt fluctuations in price under slight changes in supply.

Any article which, tho not necessary, is yet clung to with persistence by consumers, has a similarly inelastic demand. Meat, for example, tho not a necessary, has an inelastic demand among the well-to-do. On the other hand, the substantial comforts of life — things not indispensable, yet prized by all the world — often have an elastic demand. Such are those articles of food which, tho not necessities, please by their flavor and variety. For almost all except the well-to-do meat is such an article. In the upper part of the supply it has an inelastic demand, in the lower part a very elastic demand. Sugar, fruits, vegetables, tea,

¹ The demand curve of a commodity for which the elasticity of demand is unity, is a rectangular hyperbola. It is a curve such that every rectangle drawn parallel to the axes (asymptotes in the language of geometry) of our figure, of which the corner impinges on the curve, has the same area. As will be explained later (Chapter 18, § 1) the elasticity of demand for money is unity; the demand curve for money is a rectangular hyperbola.

coffee, and cocoa have probably an elastic demand thruout the range of supply; so have books, furniture, houseroom, clean and decent clothing.

In general, elasticity of demand is increased by an equal distribution of wealth, while an unequal distribution leads to inelasticity in demand. This effect of inequality illustrates once again the caution which needs to be observed in applying the principle of diminishing utility to the phenomena of value as they appear in modern communities. If all people had the same incomes, diminishing utility would be the one cause acting on the elasticity of demand, and the inclination of the demand curve would be significant of the rate of diminution in the enjoyments yielded by successive increments. In fact, the demand curve is much affected by the circumstance that persons of means can afford to bid high for the first increments, while the great number of those with small means cannot bid until a low price is reached. The lower bids of the latter — signified by a demand curve descending sharply thru a part of its range — mean a diminution not so much in enjoyments as in money means.

§ 3. We proceed to consider how the mode in which the value or price of an article is determined at any particular time — the problem of market value.

Suppose the supply of a commodity to be fixed; suppose it to be offered on the market by competing sellers; suppose it all to be offered without reserve. Then the value of that commodity will be determined by its marginal vendibility. If all is not sold at that price by the competing sellers, some part of the stock will not be disposed of. This situation is graphically represented in Figure 3. Give a supply OS , the resulting price will be at the point where the perpendicular line SS' will cut the demand curve DD' . That line ($SS' = OP$) measures the marginal vendibility of the supply OS , and so measures the price at which that supply will be sold.

The total exchange value of the supply is indicated by the area $OPS'S$ — the supply multiplied by the price. Total utility is indicated by the irregular area $DOSS'$; consumer's surplus by

the (more or less triangular) area DPS' . Those purchasers who, rather than go without the article, would have been willing under

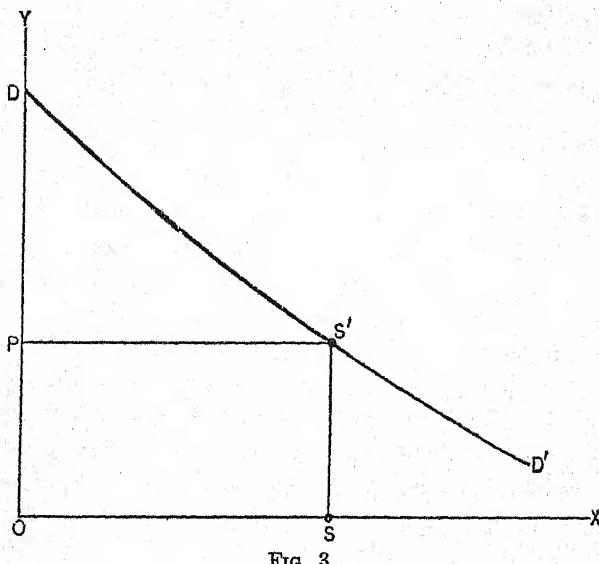


FIG. 3.

stress to pay a higher price than SS' — as high as OD — secure some surplus of satisfaction.

The same proposition, regarding the mode in which the value of an article at any given time is determined, was stated by the older writers in a somewhat different way. They said that market value was settled by the equation of supply and demand. The everyday way of putting it is to say simply that the value of a thing is determined by supply and demand. This is loose, since it implies that supply and demand are causes that act independently, and are not themselves influenced by price. But demand, in the sort of case here supposed, is certainly affected by price. The lower the price of an article, the more of it will be demanded; the higher the price, the less will be demanded. To say that price depends on demand, therefore, seems to be reasoning in a circle; since, if price is affected by demand, demand is no less affected by price. Hence the more careful phrase just quoted:

the equation of supply and demand. Given a *fixed* supply, there is one price at which the quantity demanded will be just equal to the fixed quantity supplied. To assume that there is one such price, and not more than one, is to assume continuity of demand, as explained in the preceding section — an assumption that holds good of the vast majority of articles bought and sold in the markets. This one price evidently represents the marginal vendibility of the supply. Tho the phrases "marginal utility" or "marginal vendibility" were not used by the older writers, their version of an equation of demand and supply states substantially the same proposition as the more modern one which reasons on the basis of diminishing utility — marginal utility and marginal vendibility.

§ 4. In both of these statements of the principle of market value — the older one of an equation and the newer one of the marginal vendibility of supply — the underlying assumption is that a fixed quantity is put on the market. But is this assumption tenable? Does it conform to the usual state of facts? We have just said that demand, in the sense of quantity demanded, is not independent of price. Is not the same true of supply? In the ordinary case, it is hardly accurate to say that the quantity offered in the market is fixed, and is independent of price. As price goes higher, more sellers will be tempted to offer their wares, and supply will become larger. As prices go lower, supply will become smaller. Must not the theory of market value be adjusted to variable supply as well as to variable demand?

In some instances the supposition of a fixed supply is clearly in accord with the facts. When a large crop of strawberries comes on the market, it must be disposed of once for all. There is no keeping back any part of the supply of a perishable commodity. The total quantity on hand must be disposed of for what it will fetch — for the marginal price. Not very long ago, the list of commodities of this kind was a large one; it included fresh fish, all vegetables and fruits, even meat. But modern improvements for the preservation of nearly all such things, thru cold storage and canning, have greatly shortened the list. Most commodities are not put on sale with headlong suddenness. They are

offered in installments. They come into the market in a flow or stream, not as an abruptly offered stock. The rate at which they come in, and the amount which will be offered at any given time, depend on the price. A higher price quickens the flow and leads to larger supply; a lower price checks the flow.

It is not difficult to adjust the theory of market value to the case of variable supply. On Figure 4, let SS' represent the con-

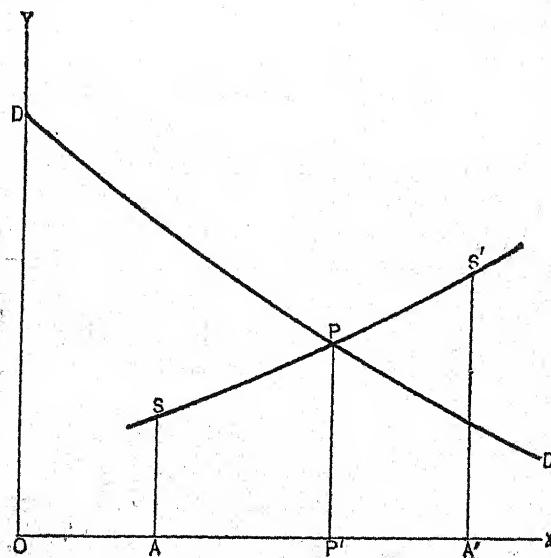


FIG. 4.

ditions of a supply that varies with price, becoming greater as price rises and smaller as price falls. Here, as on the previous figures, quantities are measured horizontally along the axis OX or parallel to it, and prices perpendicularly along the axis OY or parallel to it. At the price SA , we may suppose the quantity OA to be forthcoming on the market. As the price rises, the quantity increases. At the price PP' , the quantity offered is OP' ; at the price $S'A'$, the quantity offered is OA' . Evidently the line SPS' , which is the supply curve, has an upward inclination, the reverse of the inclination of the demand curve DD' .

A rise in price, which causes the quantity demanded to become less, causes the quantity offered to become greater.

The supply and demand curves, moving in opposite directions, must meet; and in our figure they meet at P . The price PP' is the equilibrium price, the market price fixed by the play of varying supply and demand. At that point the quantity offered is equal to the quantity demanded: the equation is satisfied. If a higher price is asked, the quantity demanded will be less and the quantity offered will be greater. Sellers will put on the market more than buyers will take; price will fall; some sellers will then withdraw and some buyers will come in, until equilibrium is reached. And so in the reverse case: at any lower price, some sellers will withdraw, some buyers will be tempted in, and readjustment will again bring the price to the point of equilibrium PP' .

§ 5. It has just been said that of these two modes of statement — the one proceeding on the supposition of a fixed supply, the other on that of a variable supply — the second is more in accord with the facts. Yet the first likewise is so in accord. Both must be had in mind for an understanding of the course of prices in a market.

On any given day, in a well-organized market, the actual settlement of market price undoubtedly takes place thru an adjustment of supply as well as thru a response from demand.) On the cotton exchange or the produce exchange, or in any place where brokers and dealers meet, a process of higgling and bargaining goes on. More or less of the article is offered and demanded, with fluctuations in prices which are usually within narrow limits on any one day and which result in an equilibrium price for that day. But this daily equilibrium price is itself affected by an underlying and more important equilibrium price. While the amount which is offered in the market from day to day — the supply — varies considerably, and varies in response to changes in prices, the total amount which can be supplied over a large period usually is fixed.) Take, as a typical case, the price of cotton, which fluctuates on the exchanges from day to day in response to the ever-changing play of offer and demand.

The total amount of cotton available for the season is not a variable quantity. It is so much and no more, depending on the crop of that season. The price at which the whole will be disposed of depends on its marginal vendibility or on the equation of supply and demand (whichever mode of statement be preferred) and is the outcome of a total supply which is fixed. The fluctuations in price from day to day oscillate about this seasonal equilibrium price.

Still using the cotton market and cotton prices for examples, we may note that, while the supply for the season is fixed, no one knows in advance with certainty just how great that supply is; still less at what price the supply, even if accurately known, would be disposed of. Hence a period of uncertainty, of rumors and guesses, of selling and buying by brokers and dealers and manufacturers, by any one who chooses to operate on the cotton market — in short, all the phenomena of speculation. Cotton in the United States (the crop in this country dominates the world market) is picked in the autumn, and the amount harvested is known by December 1. But thruout the summer months there are reports of the condition of the growing plants, which foreshadow, tho with uncertainty, the amount of the coming crop. During the picking season more and more certainty is reached. Finally, under modern methods of gathering such information, the amount comes to be accurately known. Then rises the question to what degree the price will be affected by the amount. It is certain that a small crop will command a higher price, a large crop a smaller price. But the conditions of demand or consumption are fluctuating from year to year, no less than the supply from the crops. Just what will be the seasonal equilibrium price for a crop of a given size, no one can say in advance. It is reached by a succession of tentative market prices. From day to day, and from month to month, the market price is settled by the adjustment of variable amounts offered in the market by dealers. For the season, it is settled by the adjustment of a fixed supply to the marginal price at which the whole will be disposed of.

It is not to be supposed that even on a single day is there one price rigidly settled by the equilibrium of demand and supply.

Even in the most highly organized markets there may be simultaneous sales at different prices; and, where there are newly discovered conditions affecting the seasonal range, such as a crop report, there may be considerable fluctuations in the course of a day. These oscillations give the opportunity to the astute bargainer. Some buyers, not cool-headed enough to bide their time, will pay more than the equilibrium price. On the other hand, some sellers, unduly anxious lest their supplies be left on their hands, will sell at less. {The shrewd and unexcitable person, carefully watching the course of dealings, may buy at one price from the over-eager sellers and sell on the same day at a profit to over-eager buyers. It is sometimes said that all the capital a speculator needs is a pencil and a block of paper, and all the knowledge he needs is a knowledge of human nature.} This is by no means the whole story; yet it is true that a certain faculty of judging human nature and an impassive demeanor are important in the equipment of the professional dealer, and play no small part in those speculative operations which are discussed in the next chapter.

The more the actual dealings in a market are confined to persons who are shrewd and well-informed, the more probable is it that there will be an exact equilibrium price. And in any market where dealings are habitually conducted on a considerable scale, there will be an equilibrium price which, tho not rigid, is maintained between comparatively narrow limits; and that price will represent the judgment then currently held of the probable seasonal price. Here, as in all economic analysis, we have to do not with hard and fast phenomena, but with the wavering doings of human beings. For the sake of bringing out clearly the underlying general probability — a probability which often is so great as to be virtually a certainty — we state our reasoning and conclusions in semi-mathematical form, as in the diagrams and figures that have preceded. But it must be remembered that the conclusions hold good not with mathematical certainty, but simply as statements of tendencies to which the actual market conditions more or less conform.

What is true of cotton, holds of other agricultural commodities, whose supply also is settled by the crops of each season: of wheat, corn, and other grains, of hay, flax and hemp, hops, sugar, tea, coffee. There is always a seasonal price, around which fluctuate the market prices for shorter periods. Virtually this holds of other commodities also. It is true that agricultural commodities show more unmistakably than most others the temporary fixation of supply. The supply of manufactured commodities changes more smoothly and continuously. The amounts offered in the market can often be increased and diminished without waiting for nature's process of growth. But even here there are important limitations. For any given period of moderate length — a half year or a year — there is something like a fixed supply. Iron, for example, is continuously produced, and the amount of production responds in some degree to the fluctuations in price. But the quantity available for any given period depends on the mines of iron ore and of coal which are open, and still more on the furnaces and works which are ready to smelt and shape the iron. The supply can be increased or decreased only with considerable difficulty. It will not readily decrease, because the existing iron mines and works will be kept going, unless the prospects for profit are very bad indeed; continuous operation is a condition of almost any profit at all. Nor can it be rapidly increased. New mines and works can indeed be added, but this takes time. Again, tho the output from the existing concerns does not come on the market at any fixed or regular rate, it is almost sure to be offered for sale within the current season of operations. Thus a seasonal equilibrium of supply and demand establishes itself. Around this seasonal price the current market prices fluctuate, as varying amounts are offered and demanded from day to day and from week to week.

Sometimes dealers, looking far ahead, carry stocks over a considerable period. In this way the supply on hand, even the seasonal supply, may be sensibly affected, and the seasonal market price may be affected correspondingly. If, for example, the wheat crop in any year is very large, and the price unusually

low, some dealers may withdraw considerable amounts from sale, store them, and plan to sell them at a profit in the next year, when a smaller supply and higher prices may be expected. But this is a risky operation. It involves the locking up of large money means. The next season may again bring a large crop. There is the possibility that the wheat held in storage may spoil and become valueless. As a matter of fact, very little wheat (in comparison with the total supply) is carried over from year to year, and the yearly price is determined almost solely by the crop for the time being. It is perhaps otherwise with durable commodities. If iron and copper are unusually cheap, stocks of them may be bought and put aside, with a minimum expense for storage and with no risk of deterioration, in expectation of higher prices after a year or two. Yet even for these durable articles such operations seem to be uncommon. Most persons in active business, and especially dealers and middlemen, do not try to look far ahead. They study the conditions of the present and the immediate future and govern themselves accordingly. The withdrawal of stocks from the seasonal market seems to be no considerable factor in the play of demand and supply.

§ 6. (Strictly speaking, the discussion of utility, marginal utility and of marginal vendibility applies to consumer's wealth only.) Capital yields no utilities directly. Materials, implements, machinery are but means for procuring utilities at a later date. Their utility is a derived one, depending on the utility of the consumable goods they aid in making. Tho the principle of marginal vendibility works out its results for capital goods also, it does so thru an intricate process and with some complications.

For example, when the cotton crop is small, the price of cotton rises; marginal vendibility is greater, we say, for the smaller supply. But the cotton is sold by the planters and farmers first to the dealers and speculators; they sell to the manufacturers; these again, thru another set of dealers, sell the cotton cloth to those who wear it. It is the satisfactions got by these ultimate consumers that in the end determine the value of cotton for a given supply. But the manufacturers are the immediate buyers;

and it is they who are commonly spoken of, in the language of the market, as the "consumers" of cotton. They are often in a position in which they *must* buy cotton. They have a plant which must be run if it is to earn anything at all, and a force of workmen which, to remain efficient, must be kept together. Each manufacturer wishes to keep his plant working at full capacity and his workmen fully employed; yet with a small crop there is less cotton to be worked up. On the other hand, the extent to which consumers will pay at a higher rate for the diminished amount of cotton cloth is an uncertain factor. The manufacturers try to get from the merchants and dealers to whom they sell, a higher price for cloth corresponding to the higher price of cotton. Both these sets of business men will say that it is the high price of cotton which *causes* the high price of cloth. Yet the reverse is at bottom the case; only because the cloth can be sold at a high price does the raw material command a high price. How close the correspondence in price will be, how much the investments and commitments of the manufacturers will affect the situation, how the calculations and transactions of cotton dealers and speculators, and cloth merchants and buyers, will act on prices at any one date and thru the season — these are matters on which the action of the fundamental economic forces is slow and uncertain. (There are analogous complications when there is a very abundant cotton crop. Then manufacturers are not prepared to work up an unusual supply of the raw material; merchants and retailers are not certain how far and at what prices they can find a market for additional quantities of cloth. The cotton cloth is a commodity having an elastic demand, raw cotton, despite the fact that demand for it is derived from that for cloth, may show from season to season fluctuations such as one would expect in a commodity for which the demand is inelastic.)

Other kinds of capital goods are to be used for durable tools and plant. Such are iron, copper, timber, brick, stone. In the end, the demand for these also rests on the utility of the enjoyable commodities made with them; they also have a derived

utility. But proximately the demand for them is from persons who wish to use them in connection with new investments. When the prospect of profit is good, the prices of these things rise; when the prospects are bad, their prices fall. Hence their prices are closely connected with those alternations of activity and depression, of good times and bad times, which are among the most puzzling of economic phenomena. It is true that their market price is settled by the amount which the last purchaser — the least eager of the buyers — is willing to pay. And in the end, no doubt, what that purchaser is willing to pay depends on what he can get in turn for the consumable goods made with the aid of the capital goods. But the chain of connection is a very long and irregular one, and the market price is universally affected by current expectations as to investment activity. It would be absurd to apply to these articles any strict principle of marginal vendibility. That principle, like others in economics, works out its results only in the long run, and with all sorts of qualifications and complications.

§ 7. Retail prices might be expected to illustrate most clearly the play of marginal vendibility; for here enjoyable goods are sold to their consumers, and the utilities from them are nearest realization. Yet in fact retail prices seem less subject to the working of supply and demand than wholesale prices.

Retail prices are governed proximately by custom. People pay the traditional or going price. Even the amounts which they purchase appear to be governed by custom; they buy the quantities which they are in the habit of consuming. And the retail prices which establish themselves as customary seem to be governed by wholesale prices. The retail dealers charge more when there is a considerable and apparently definitive rise in wholesale prices; and competition among themselves causes them to charge less when there is a considerable and lasting fall. No doubt, the accommodation of retail to wholesale prices is slow. (When wholesale prices rise, shopkeepers hesitate to ask more, partly because each one fears that his rival may entice a customer away by keeping to the old price for a while. Con-

versely when wholesale prices fall, no shopkeeper willingly gives his customer the benefit of the change; he waits until some competitor precipitates it. But the two sets of prices in the end move together. The retail prices are governed proximately by custom, they seem in the end to follow wholesale prices.

But all this is in appearance only. The consumption of every commodity is affected by its price. A rise in price checks purchasers, a fall in price stimulates them. So it would appear that people continue to buy simply what they are used to buying, this is true only of buyers who are above the margin—those who have been enjoying a consumer's surplus. There are always some just on the margin, to whom at the ruling price the purchase is just worth while and who cease buying when the price goes up. And conversely, when price falls, there are always some additional purchases. How great the changes in consumption are with rising or falling price, depends on the elasticity of demand. But some degree of sensitiveness there always is. So certain is this, that the wholesale dealers reckon on it in advance, and at once accommodate the current prices in the wholesale market. It is they who usually are best informed regarding the general situation. They know when a crop is short, or a new source of supply has been opened, or an invention is cheapening production and increasing the amount offered in the market. It is they, too, who can best observe when the habits of consumers are undergoing change and so are affecting the purchases of a commodity. In case of an increase in demand, any one retailer may indeed notice that his customers are buying more than before; but this may seem to him an isolated phenomenon. He simply orders more from his wholesale agent, and expects to sell more at the old price. But when orders from many retail dealers thus come in to many wholesalers, the market responds and price goes up. The retail dealer then charges more to his customers because he has paid the wholesaler more for his goods; the real influence at work being that the customers, taken as a whole, want the goods more. Here, as in all the phenomena of value and price, the stocks held by dealers, whether retail or whole-

sale, have an effect in preventing abrupt changes, and sometimes obscure and delay the restoration of the equilibrium of supply and demand. In the end, however, that equilibrium, resting on the demand of the marginal purchaser and so on the principle of marginal vendibility, settles both wholesale and retail prices.

In the earlier stages of industrial life, and even in many countries which have attained a comparatively advanced stage, retail prices are fixed by a direct process of higgling between sellers and buyers. In the very earliest and most primitive stages, when exchanges are few and sporadic, higgling plays a very important part. There is then nothing in the nature of a market price or customary price; and the astuteness of the bargainers, the needs and whims of the moment, even the possibility of physical force, affect the terms of exchange. As the division of labor is extended farther, and continuous exchange and sale develop, something like a market price establishes itself. That market price is likely soon to become a customary price, representing roughly an equilibrium of current demand and supply; but, tho customary, it is likely also to be subject to bargaining, and to vary more or less from the customary rate.

In the highly developed countries of modern times, bargaining in retail dealings has been almost entirely discarded. The dealer sets a price at which he will sell, and at that price the purchaser may take the article or leave it. The tacit understanding is that the price so fixed shall be the current or market price, and that it shall be the same for all customers at the shop. The practise of fixed prices saves a vast amount of time and friction. The purchaser need not be on the watch to discover what other dealers are asking, and what is the going price; while, if he is not a marginal purchaser, but is enjoying some consumer's surplus, he need not be on his guard lest the dealer take advantage of his potential demand. The ease of everyday purchases and the efficiency of labor in retail operations are immensely promoted. Retailing on a large scale, conducive as it is to economy of labor, would be impossible without the practise of fixed prices. In many parts of the continent of Europe it has not been fully adopted.

There the retail dealer still asks, not the price which he will take once for all, but a price which he hopes to get from the individual purchaser, and which he is prepared to lower if the purchaser bargains shrewdly. The result is friction, waste of time, and inefficiency.

§ 8. The current market rate is what people usually have in mind when they speak of a "fair" price. This is what the retail dealer is expected to charge as his fixed sum. If he asks a higher price than is usually asked at the time by other dealers for the same thing — still more, if he asks a higher price from one purchaser than from another — he is said to be charging unreasonably, or overreaching, or even cheating; and he is likely to lose his custom. There is often a similar attitude in regard to wholesale prices. Many large dealings in the wholesale market are concluded, in the great civilized communities, on the principle of fixed prices. A manufacturer or merchant in search of a given article orders what he wants from an agent or correspondent of established reputation, with the understanding that a fair price — that is, the ruling market price — will be charged. / Here, as in retail dealings, confidence in honesty and acceptance of prices as they stand conduce to the easy dispatch of business. Underlying all, however, is bargaining somewhere — a more or less overt adjustment of price to supply and demand. What is a fair price in the fundamental sense — what is the really just price at which goods shall be sold — are questions much more difficult than is supposed by most persons who use the phrases. Indeed, few who talk of fair and unfair prices are conscious of the problems involved. They are problems not of exchange, but of distribution, and therefore taken up at a later stage of the inquiry.

§ 9. The discussion thruout the preceding pages has proceeded on the assumption that utility to the buyer is the only aspect of utility that needs consideration. The seller is supposed to put his wares on the market once for all, and to dispose of them, sooner or later, on such terms as their utility to buyers makes possible. But may not utility to sellers also affect price, by

affecting supply? May not part of the supply be withdrawn by the sellers, for their own use? Would not the extent of this withdrawal depend on the price, and so introduce a further complication in the theory of market value?

It is entirely conceivable that utility to sellers should thus affect price. In the case of the five oranges, supposed above, it is conceivable that the holder of them might consider the possibility of enjoying one himself, and would be led to do so more and more as the price descended. At fifty cents he would readily part with one of his oranges, but at five cents he might conclude to eat one, and so withdraw part of the supply. And if we suppose, not one seller with a few oranges, but many sellers with many oranges, and suppose that among these sellers there is a considerable possibility of withdrawals for consumption, we have a new problem, more complicated than that of sales based on utility to buyers only. A great deal of intellectual ability has been given by economic writers to the analysis of this problem and to the careful statement of the terms of exchange that would result under various hypothetical conditions.

But almost all this subtle analysis is in the air. Under a developed division of labor, utility to sellers does not affect value. Men produce with no reference to their own consumption. They produce for the market. The supplies in their hands of the things made by them are so great that the importance to them of any unit is *nil*. They throw their product on the market without reserve. No doubt, if that product were very great indeed — such as to make the marginal utility to purchasers almost *nil* — the sellers might stop to consider whether they could not use some fraction of it themselves. Farmers may consume more apples when a very heavy crop causes apples (on the trees) to be nearly valueless. But any supply created by effort and with a view to sale is rarely so far increased that price sinks near zero; and where by mischance price is very greatly lowered, the effect of utilization by the makers (sellers) is so slight as to be negligible. In the ordinary case, virtually the whole supply is offered once for all on the market.

The case would be different if supplies got into people's hands without reference to sale and disposal from the start. If they were rained down from heaven, in small amounts, prices would be affected by utility to sellers quite as much as by utility to buyers. We may imagine that, in early times, before division of labor and exchange had developed far, sporadic exchanges took place under these apparently simple tho really complex conditions. But they must have taken place either with very vague consciousness of utility, or under the influence of customs which greatly affected the actual terms of exchange. Ingenious hedonistic calculations probably throw little light on what happens in the stray exchanges of barbarians.

There are, however, in the modern world occasional cases where exchange is affected by utility to sellers. When a fine old picture or a family heirloom is put on the market, its price may depend much on the attachment which the owner feels for it. Articles of this sort, of sporadic and limited supply, are in any case largely indeterminate in value; since buyers are few and demand is discontinuous. Their price may be made still more indeterminate by the fact that the seller (or sellers) may set store by the few specimens. The same is true, tho in very much less degree, of dwellings adapted to individual tastes. The ordinary house, planned like many others of its class, comes on the market on nearly the same terms as other goods of homogeneous supply. But an odd house, built to suit the owner's idiosyncrasies of taste, stands more or less by itself. Its selling price may depend not only on the going price for houses of this range of desirability as estimated in the general market (that is, as estimated by buyers), but also on the attachment which the owner has for this particular one.

CHAPTER 11

SPECULATION

Section 1. The fundamental effect of speculation is to mitigate fluctuations, 156 — Sec. 2. Dealing in futures lessens price fluctuations, 158 — Sec. 3. Exchanges; standardizing, 160 — Sec. 4. The evils of speculation: gambling; unproductive labor, 162 — Sec. 5. The evils of stock exchange speculation, 164.

§ 1. The phenomena of speculation connect themselves with the settlement of market prices. Something more may now be said on the good and ill of speculative dealings.

The term "speculation" is used in various senses. Often it implies the buying and selling of things by a person whose main business in life is different — "dabbling" in the market by "outsiders." But as often it implies buying and selling by persons who expect to make their living or their fortune by dealing in one commodity or in certain sets of commodities — persons who are "professional speculators." These are sometimes distinguished again from "legitimate" dealers, such as the wheat merchant or the cotton factor, who buy and sell a commodity year in and year out, and are permanent middlemen for those who have it to sell and those who wish to buy it. Between these various sorts of persons there are insensible gradations. All their operations have effect in determining market price; and all are more or less in the nature of speculative dealings.

(The fundamental effect of speculation is to promote the establishment of the equilibrium of supply and demand. It tends to make daily market prices conform to the seasonal market price, and to make the seasonal market price such that the whole seasonal supply is disposed of.) Those who are skillful and pains-taking in estimating the seasonal supply, and are shrewd and experienced in foreseeing the effect of a given supply on price, are the persons who are likely to make money in speculation.

They buy when others offer at a price lower than the facts of the market warrant; they sell when others bid a price higher than the facts warrant. The more the dealings of the market are confined to buying and selling between such shrewd and experienced dealers, the more likely is it that the seasonal price will be quickly and smoothly reached, and the less will be the fluctuations in price. With the inevitable uncertainties as to the amounts of the forthcoming supplies and the conditions of consumption and demand, there will always be differences of judgment between even the most expert dealers. There will be fluctuations in price, some ups and downs, some unexpected gains and losses — "speculative" profits or losses. But the general effect of speculation is to lessen fluctuations and promote the smooth course of exchange and consumption.

This lessening of fluctuations is advantageous alike to the ultimate consumers, and to those manufacturers who in business parlance are often spoken of as the "consumers" of a raw material. For the ultimate consumers, say of wheat, the early and exact adjustment of price brings more even utilization of the available supply. If the crop be short, some lessening of consumption is inevitable; and it is better that the deficit be spread thru the season. The sooner and the more exactly the higher price is reached, the more likely is this result. Conversely, a large crop is better sold at a low price thruout the season than at prices ranging from high to low as the season progresses.

The good effect of speculation in this direction has been illustrated from the experiences of older days, when wide fluctuations in the price of food were common. Under modern conditions, with great areas of supply brought into competition by railways and steamships, abrupt changes in the supply of most foodstuffs and raw materials are rare. A poor crop in one country or section is likely to be offset by a good crop elsewhere. The seasonal supplies do indeed change, and prices go up and down under their influence; but the variations are seldom great. But under such conditions as existed under the limited geographical

division of labor before the eighteenth century, great fluctuations were common. Then the area from which any district or city got its food and materials was strictly limited. A crop deficiency meant a short supply, and necessitated the adjustment of consumption to that short supply. The dealers or speculators or "forestallers" who secured the supply and at once demanded high prices for it, brought about the inevitable adjustment and caused a more even utilization of the stock in hand. All this was reasoned out by some of the older writers on economics, and led them to a warm defense of speculators and to a condemnation of laws aimed against speculation. Very likely their defense of speculation was carried too far. The process of buying from the farmers did not necessarily take place under active competition by the dealers or speculators, nor did that of selling to the consumers; and the gains of the speculators were enhanced by the ignorance or heedlessness of both farmers and consumers, and might easily be thought larger than could seem reasonable. We know very little of the details of what took place in these early days, and are prone to project into them ideas or conclusions based on our own experiences. But none the less it is probable that even in those times the influence of speculation was in the main to lessen fluctuations and promote the expedient rate of consumption. It is certain that this is its tendency under the modern conditions of wide markets, full information, active competition.

The development of cold storage in recent times has led to precisely this sort of equalized distribution of supply under the influence of dealings that are essentially speculative. Fruit, meat, fish, eggs, no longer come on the market in spasmodic and irregular amounts. Supplies that are heavy at one time are bought by dealers, put in storage, and held for sale at a later period of scantier supply. Prices are more equable, and on the whole the profits of dealers are probably less. There is less risk to them, and the community gets its supplies at a smaller charge for their services as middlemen.

§ 24 The process of lessening fluctuations and distributing

risks is promoted by the practise of dealing in "futures"—a practise with which the term "speculation" is especially associated. Goods are bought and sold not only for immediate delivery, but for future delivery as well. The person—say the dealer—who undertakes to deliver in the future a certain quantity of wheat at a certain price may not have in his possession the goods he sells; indeed, in the common course of such dealings in the modern markets, he usually does not have them. He gauges the probabilities of the future, and undertakes delivery on the terms which those probabilities suggest. Virtually, he guarantees a certain price for the future, and takes his chances as to whether the guarantee will bring him gain or loss. The buyer is then relieved of the risk. The advantage of this security is easily seen. The miller, for example, may wish to close a contract for the sale of flour in the future. By securing the needed wheat at a guaranteed price, he is freed from all the risk of ups and downs, and can give his undivided attention to his proper business of manufacturing flour.¹

Hence it has happened, since the establishment of exchanges and the development of their varied operations, that millers carry on their business with a much smaller margin of profit than formerly. The difference in price, weight for weight, between wheat and flour, is much less than it was thirty or forty years ago, and the public gains in so far. When, for example, the flour-milling industry was first established at Minneapolis—where the falls of the Mississippi supplied power for grinding the wheat of a region singularly adapted to its growth—the possibility of profit for the miller was great. But he then underwent also the chances of loss from fluctuation in the price

¹ Even if he is not contracting for the future sale of flour at a given price, but is simply manufacturing continuously for the market, he can escape by this same mechanism from the risk of fluctuations in the price of wheat. When he buys a given quantity of wheat to be ground into flour, he can sell for future delivery the same quantity of wheat. Thereafter, as wheat goes up or down, he loses as much by the one of these transactions as he gains by the other. The fluctuations no longer trouble him. This is the common practise among "conservative" millers. Cotton manufacturers also are getting more and more into the practise of thus "hedging" in their purchases of raw cotton.

of wheat. As the exchanges developed, and with them the practise of dealing for future delivery, he was able to free himself from these chances. The consequent regularity and solidity of the industry contributed to its systematic development on a great scale and so to the cheapening of flour. Inventions and improvements no doubt contributed greatly; but the elimination of market risks had an important share in reducing the difference between the price of wheat and the price of flour. Both in merchandizing and in manufacturing, the growth of large-scale transactions, tho it has increased the gains of those individuals who have the ability to carry on large operations, has lessened the margin between buying price and selling price, and so has operated to lower prices for the consuming public.

The dealer or speculator who has sold for future delivery does not usually run all the risks of the transaction himself. He is likely before long to buy from another dealer, for future delivery, some part of what he has contracted to deliver, perhaps the whole; that other dealer, in turn, shifts part of the business to a third; and on. The process of gauging the course of the market fluctuations is hardly ever carried thru the whole of a season by one person for any one transaction. The dealers constantly buy and sell among themselves, and divide risks and profits and losses. It is extremely rare, consequently, that any one dealer or any one person buys at the lowest price of a season and sells at the highest price, making the utmost possible gain; or that any one buys at the highest and sells at the lowest price, incurring the maximum loss. Every dealer has losses as well as gains. On the whole, if he is shrewd and experienced, he gains more than he loses. He may lose money in one season, but he will make money in another, and in the long run he will earn something in the nature of a professional income. If he is gifted with unusual ability for such operations, he may make gains almost invariably, reap great profits from large transactions, and close his career with a fortune.

§ 3. When commodities are produced on a large scale for distant markets and for scattered purchasers, and middlemen

become necessary links in the division of labor, it is inevitable that the middlemen should arrange to be near each other for the convenient disposal of their business. A street corner may serve as a meeting place. Traders in one commodity will settle near each other in a given street; hence in every great city there are dry goods streets, hardware streets, boot and shoe and leather streets, and so on. When, in a populous and thriving country, commodities are produced in large quantities and are necessarily dealt in by many persons, an exchange is set up — a room or building where the traders meet at fixed hours. Rules are agreed on, governing and interpreting their transactions in such detail that enormous sales are effected by a nod of the head and are recorded on scraps of paper with a few figures and initials. The actual dealings on exchanges are often done by brokers only, who are middlemen for the middlemen. They act simply as agents, earn their living by a commission (usually at a rate extraordinarily small) on sales and purchases, and buy or sell for any one who chooses to transact business thru them.

The smooth dispatch of business on exchanges is further assisted by the "standardizing" of the articles dealt in; that is, by grading and classifying them according to quality. This process puts an end to all disputes regarding the quality of the things contracted for. Thus grain is examined as it reaches the Chicago market by publicly appointed inspectors, and is graded as being No. 1, No. 2, No. 3. Thereafter, when a purchaser has his wheat delivered to him, neither he nor his vendor need inquire further whether it is of the stipulated quality. Delivery of elevator receipts, certifying the grade, satisfies all contracts. Any article that is homogeneous in quality, or is easily classified into distinct grades, can thus be dealt in with the minimum of friction. Grain is the typical commodity of this sort. Cotton is similar to it, thru its evenness of quality. Wool, which varies remarkably, is much less susceptible of rapid speculative purchase and sale. Attempts have been made to standardize iron, and in England a system of semi-official grading exists under which large transactions in it are carried on; but in the United States and on

the Continent this mode of dealing in iron has never come into considerable use.

§ 4. Against the advantages which professional speculative dealings bring are to be set serious evils. These evils are made possible and are enhanced by the very facilities which enable speculation to work out its good effects.

When once a commodity has been standardized, a new possibility opens; anybody and everybody can deal in it. Ordinarily he who buys an article must know something about it. He must be able to judge whether what is offered to him is good or bad in quality, worth more or less. But on an exchange where commodities are officially graded, no such questions arise. Only price, present and future, need be considered. Any one can buy if he thinks the present price low or sell if he thinks it high. Such buying and selling are done on an enormous scale by large numbers of persons who do not possess or wish to possess the articles they buy or sell, and whose only concern is to make a profit by taking advantage of fluctuations in prices. They virtually bet on the future price of the commodities, and gamble about it as men gamble on cards or on horse races. In form their dealings are like any others on the exchange. The brokers receive from these "outsiders" orders to buy and sell, and by the rules of the exchange are held responsible for delivery at the stipulated time. They hold their customers in turn to this same responsibility. But, tho thus in form like any other dealings, on the better-known exchanges—the cotton and grain exchanges, for example—the immense majority of the transactions have in view no *bona fide* business. The machinery which has been devised for the easy and rapid transaction of business is utilized for gambling on a large scale.

Here we have an example of unproductive labor. Of course, dealers, middlemen, brokers, are useful, and their labor is productive, so far as they serve to facilitate exchanges under an elaborate division of labor. Just how much labor can be usefully given to this sort of work, it would be difficult to say. If the only persons engaged in the transactions were merchants

and dealers who systematically and continuously gave their time and effort to it, their number would adjust itself automatically to the work required — much as the number of carpenters or physicians adjusts itself to actual needs. But where there is "illegitimate" speculation on a great scale, the number of brokers and dealers accommodates itself to this new demand for their services. Not only the labor of the speculators, but that of their agents, is unproductive; it adds nothing to the output of society. In no country is there so much of this parasitic activity as in the United States, for here all the conditions favorable to it are found — a highly developed division of labor, markets and exchanges on a great scale, and a population both venturesome and prosperous. "Business" to many an American means simply speculative gambling.

Unquestionably, the "outside" speculators, or the "public," like all amateur gamblers, are losers as a class; and most of them are in the long run losers individually. The shrewd and experienced professional dealers know better than they the probable course of prices, sell to them and buy from them to advantage, and on the whole make money from them. Occasionally an able or lucky person makes a hit, and carries off a large share of plunder from a successful operation on the exchange. This then acts on the imagination of others like a great prize won in a lottery. The chances that the speculative public will lose are almost as great as the chances that the purchasers of lottery tickets as a whole will lose: they amount virtually to a certainty.

Unmistakable as are the evils of speculative gambling, it is exceedingly difficult to check them by legislation, still more to put an end to them. The common law already makes void transactions which are sales in form merely, and which contemplate a settlement only of the difference between present and future price. But on the exchanges all transactions purport to be for the actual delivery of the commodities, and in strict legal effect are so. An obvious remedial measure is to prohibit buying and selling for future delivery, since it is in connection with such contracts that the gambling operations most often take place.

But this would put an end also to the benefits which the community gets from contracts for futures; and it is a question whether the loss would not outweigh the gain. The common opinion of American and English economists is against the prohibition of future contracts, which, so far as grain is concerned, has been put into effect in Germany. Yet the evils of speculative gambling are so great that something may be risked for the purpose of lessening them. Lotteries and avowed gambling houses have been prohibited, and the law does its utmost to prevent organized betting on horse races; and all it can do to stamp out other forms of gambling is welcome. No doubt, the most effective remedy would be a better moral standard for all industry, and an aroused public opinion against all kinds of gambling. But the worship of wealth, and the well-nigh universal desire to make money on easy terms, even tho at the expense of others, together with the close association of this sort of speculation with business dealing rightly deemed legitimate, render it difficult to bring public opinion to bear.

§ 5. What has been said in the preceding sections applies in the main to stock exchange speculation also; but the problems appear here in accentuated form. Here, too, advantages are to be set against evils. The advantages, it is true, are of a different sort from those secured by grain and cotton exchanges. They arise, not from the lessening of fluctuations or the facilitation of large-scale dealings, but from the promotion of investment.¹ They are real and important. But the evils are no less real, and are intensified by the unusual ease of entering on the transactions. Stock exchange securities are ideally homogeneous and standardized. One share of a given corporation's stock is precisely as good as any other share. If it is easy for any one to buy grain or cotton, even tho he has never looked at the articles, it is still easier for any one to buy stocks and bonds, even tho he knows nothing about the corporation that issues them. At the same time, fluctuations in the prices of securities are large and frequent. Opinion regarding their probable course depends (or

¹ See Chapter 6.

seems to depend) quite as much on general judgment and general prospects as on expert information. Hence rampant speculation, by outsiders and insiders. Here, as in the case of commodity speculation, the "public" loses in the immense majority of transactions. The professional speculators and dealers get the advantage of the miscellaneous public, both because they are better informed regarding the real prospects of the enterprises whose securities are dealt in, and because they are (by a process of quasi-natural selection) persons shrewd in judging human nature and quick to take advantage of the irresolute. Yet notwithstanding the constant losses, there is an unfailing stream of persons who take fliers on the stock exchanges. There are probably few Americans of the well-to-do classes who have not at one time or another tried their hands at a stock speculation; and there are a great many who habitually gamble in stocks. The immense majority of these dealings are concentrated at the New York Stock Exchange, which is at once the greatest institution in the world for facilitating investment and the greatest of gambling hells.

The evil from the situation arises not only or chiefly from the losses of the unsuccessful speculators. What these lose, others gain, and usually there is not much to choose between winners and losers. The economic loss arises primarily from the waste of much brains and energy on unproductive doings. The waste is more than that of the labor given directly, the labor of the brokers and their under-strappers and of the speculators themselves. It is increased by the demoralization of many men in the community who take no great direct share in speculation. Like all gambling, it distracts from the sober, continuous work on which the common welfare rests. Morally it is no less harmful. In every aspect the evil is one of the greatest in contemporary society.

It must be frankly confessed that no really promising remedies have been suggested. Some excrescences have been aimed at in proposals for reform in New York — proposals which look to improvement thru the revision and enforcement of the rules

made by the exchanges for themselves. Such things as rigging of the market, "wash sales," manipulation of prices with intent to deceive, are to be thus prevented. But even if all of these tricks were cut out, the main evil would remain. In Germany a more drastic remedy was tried — the requirement of publicity in stock dealings, thru enrollment of names and transactions on a register open to general inspection. It was expected that men would refrain from stock gambling, as they will from many doings of doubtful aspect, if they must be seen in the act. Such a requirement would be met in the United States by the objection that it intrudes on the sacrosanct secrecy of business, an objection commonly brought against public supervision of every sort, yet in itself of little weight. Much more serious is the objection that in Germany the regulation in fact had little effect: stock speculation remained much the same in character and amount. Possibly this is because of the difficulty of effective enforcement. At all events, tho the evil is there, no clear remedy of a direct sort is in sight. Greater regularity of all industry would lessen fluctuation in values, and so lessen speculation; but this could hardly be attained except at the cost of progress. Better public opinion would lessen "outside" speculation; but the enlightenment of public opinion proceeds very slowly.

CHAPTER 12

VALUE UNDER CONSTANT COST

Section 1. The simplest case first assumed: a supply absolutely flexible, free competition, constant cost. Value then determined by cost, 167 — Sec. 2. Illustration by diagram, 170 — Sec. 3. The proposition points to a tendency or approximation only; to what happens in a "static," not in a "dynamic," state, 171 — Sec. 4. Some explanations and qualifications. Flexibility in supply never perfect, often much impeded. Changes in demand from fashion. How far free competition holds. Good will. A small surplus above cost price may mean large profits, 173.

§ 1. In the preceding chapter, the adjustment of value was considered under the supposition that supply was fixed; fixed, not indeed for the day or the week, nor rigidly over any length of time, but fixed on the whole for the season or the period of production. But even for the agricultural commodities whose production is seasonal, there is variation in supply over a series of seasons. For other commodities there is clearly a considerable and sometimes rapid flexibility in supply. The amount produced and put on the market changes more or less easily. In what way do the variations in supply take place, and in what way do they affect the value of commodities?

We may begin by taking the simplest case, and, for the purpose of bringing into sharp relief a principle, make again an extreme supposition. In the preceding discussion of demand and supply and of market value, an absolutely fixed supply was assumed at the outset. Let now the other extreme be assumed, a supply absolutely flexible. Suppose a commodity produced, under the simplest conditions, by a large number of persons. Suppose that all these persons are competing with each other; that any one of them can easily engage in producing the commodity and as easily withdraw from producing it. Suppose all to be carrying on operations under the same conditions, no one of them producing more cheaply than another. Such a commodity

would be brought to market under conditions of constant cost, and would be sold at a price conforming to that cost.¹ At any moment its value would indeed be determined directly by its quantity — that is, by marginal vendibility as analyzed in the last three chapters. But if its value, so determined, were greater than its cost, more persons would be led to engage in its production, supply would increase, and value would fall. If its value at any time were less than its cost, some persons would withdraw from its production, supply would decrease, and value would rise. The greater the ease of entering on the industry and of withdrawing from it, the more rapid and certain would be the adjustment of supply to that amount which would just sell at cost price. If perfect flexibility in supply be assumed, the adjustment of value to cost would be perfect, and the article would always sell for just what it cost to produce it.

Before proceeding further, a word of explanation, and in some ways of warning, is needed, as to the sense in which cost of production is here spoken of. The term is used in very nearly the ordinary commercial sense; it refers to the outlays which an employing capitalist must make in order to get a commodity to market. Chief among those is the outlay for the wages. Charges for material are another item. These charges, it is true, commonly imply that another capitalist has previously paid laborers to make the materials, which then have been sold to the particular employer in question; hence the latter may be said to have indirectly hired these other laborers also. Not only the wages paid to workmen, directly or indirectly, must be included, but a reasonable remuneration for the employer's own time and trouble. This remuneration, like that of the workmen employed, is to be reckoned according to current market standards — what a workman or an employer of this kind would ordinarily receive for his labor. Again, interest on the capital used is to be included, reckoned also according to the current market rate. If the employer borrows the capital, he must pay the current rate of interest

¹ By "constant cost" is meant not only that cost is uniform, but that it remains the same whether the total output be larger or smaller.

on it. If he owns his capital, he considers that he could get a return on it at that rate by lending it out to some one else; and he regards interest on his own capital precisely as he regards remuneration for his own labor — something for which a return at the usual rate is to be expected. It will be noticed that rent paid for land is not included in this enumeration, altho a business man would include it in his reckoning of cost. The reasons for this omission will be made plain when the subject of rent comes up for consideration.

These various outlays, or equivalents of outlay, are sometimes spoken of as "expenses of production." That term is sometimes used by way of distinction from "cost of production," emphasis being thus laid on the fact that the employing capitalist is concerned solely with what he pays for labor, for materials, for the use of free or fixed capital. When on the other hand the term "cost of production" is used with the design of pointing to a distinction from "expenses of production," reference is made to the sacrifices undergone; to the labor of the hired workman, and not to his wages; to the trouble, anxiety, and work of superintendence of the employer, not to his profits or ordinary gains; to the previous saving by which the capital has been accumulated, not to the interest on that capital. As will be seen at a later stage, some of the most important and difficult problems of economics connect themselves with the distinction between cost of production in the sense of labor and sacrifice, and expenses of production in the sense of outlays.¹ For the present, however, we need not do more than point out the distinction, in order to make clear in what sense we are speaking of cost. We mean by it not cost in the sense of labor and sacrifice, but expenses of production — outlays of a capitalist. If we should think of a workman, or set of workmen, producing independently and without being hired by employers, we should reckon their "cost of production" for the purposes of the present discussion, not in terms of hours or days of work (*i.e.* sacrifice), but in terms of the wages they would ordinarily get for their work.

¹ See Chapter 48.

§ 2. The mode in which value would be adjusted under the conditions of constant cost and absolutely flexible supply is indicated on Figure 5. The cost of the commodity is indicated by SO , the distance from the horizontal axis OX to the line SS' . Whatever the amount of the commodity produced, that cost remains the same for each unit brought to market; whether the quantity be OA , OB , OC , the cost per unit is the same. Hence SS' , indicating the conditions of supply, runs parallel to OX . Let the line DD' indicate the conditions of demand, as in previous diagrams. It descends as quantity becomes greater, price falling with the increase in supply and the consequent lessening of vendibility. The supply of the commodity would then settle at the amount OB or SB' . The demand and supply lines would intersect at the point B' ; there would be equilibrium at the quantity OB and the price BB' ($= SO$). If the supply should diminish to OA , the price might rise temporarily to AA' , A' being the point at which the supply OA intersects the demand line. The marginal vendibility of the diminished supply would be raised to AA' ; the smaller supply (OA) would sell at a higher

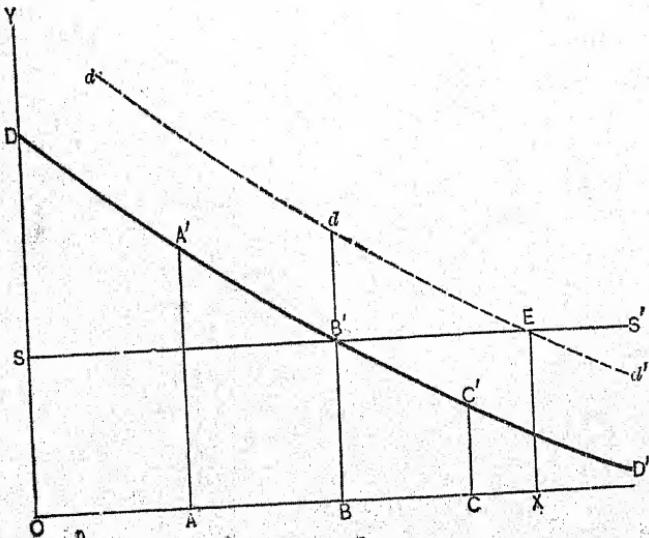


FIG. 5.

price. But that higher price would lead, under the conditions of constant cost, to a prompt increase in supply. Producers would be getting more than sufficed to induce them to bring the commodity to market. They would compete with each other, increase supply, and so bring down price. If the supply should be increased, not only to B , but to C , the total being then OC , they would overreach themselves. For the amount OC , the price would be CC' , the point of intersection with the demand line being then C' . This sum (CC') is less than cost; some producers would promptly withdraw; supply would again diminish. For the quantity OB , the price is just sufficient to make production worth while to all, and at that amount the supply would settle.

If now for any reason demand should increase, quantity would so increase as still to leave price at the same point. Suppose a change in fashion, or other cause leading to an increased demand. This is represented by a shifting of the demand line to the right. It is now dd' , whereas before it was DD' ; at each several price, more of the commodity is demanded than was demanded before at that price, and the marginal vendibility of any given supply is greater than it was before. With the supply OB , the price under these new conditions of demand would be not BB' , but $BB'd$ — higher than cost. Supply would again increase, until the total supply was OX . Then the demand line would be intersected at the point E and price would be $XE=BB'$. A new equilibrium would be established, not with a change in price, but with a change in quantity supplied.

Under the conditions of constant cost and free competition, demand or marginal vendibility determine not price, but quantity supplied. The proximate condition determining value is indeed always marginal vendibility. Where supply is fixed, price is settled once for all by marginal vendibility. But where cost is constant and supply is completely flexible, price cannot depart far from the level fixed by cost. The supply on the market will be such as can be disposed of at the cost price.

§ 3. The assumptions made at the beginning of this chapter —

constant cost, flexible supply, free competition — are never, in a literal sense, in conformity with the facts of industry. There never is a case when these conditions are exactly fulfilled. None the less, there is a wide range of industry in which an approximation toward their fulfillment is found, and in which the principle of value under constant cost explains the broad facts.

Cost is never exactly equal for all producers. In the previous exposition, such equality has been assumed. The fact that a general change in cost may take place, affecting all producers, does not necessarily alter the application of the reasoning. An invention or improvement may lower cost for all; the horizontal supply line on the diagram may be lowered; but the result is merely adjustment to a new level, not the introduction of a new set of conditions. If, however, the lowering of cost takes place not at the same time for all the producers, nor in equal degrees, we have a new principle and a different case — production at varying cost. This is what in fact happens when inventions bring about a reduction in cost. (The change takes place by successive steps. The more shrewd and enterprising of the competitors introduce the improvements first; others follow suit; gradually all adopt it.) And by the time all have adopted one improvement, another may be introduced, and the same steps are again gone thru. If there be a succession of changes — and such are likely in the highly progressive modern industries — equality of cost never exists. There are always some producers who are turning out their goods at lower cost than others.

None the less, over probably the greater part of the industrial field there is a tendency to equality of cost. The differences in cost are not permanent; the process is simply one of gradual and irregular adjustment to the new level, instead of prompt and even adjustment.

Some writers have stated the difference between actual conditions and long-run tendencies, by distinguishing between a static and a dynamic state. In a static state competition has worked out its full result, and unless there are permanent causes of variation, commodities of the class here considered are pro-

duced at a uniform cost and always sold at a price corresponding precisely to that cost. In a dynamic state, there is flux and change, variation in cost, oscillation of price. Yet the dynamic state tends to subside into the static. Unless there be incessant reappearance of disturbing forces, the dynamic state will cease.

The real problem is thus not whether price is in strict conformity to a cost of production uniform for all competitors, but whether there is rough approximation to this situation and a tendency toward its full attainment in a static state. And such a tendency, to repeat, exists over a very large part, probably the larger part of the field of industry. A comparison has often been made to the tendency of the ocean to keep its level. Tides, currents, storms, cause disturbances, and it is never true in a literal sense that the level is maintained; none the less, there is a normal level, and the actual height of the water tends to conform to it. Or a comparison might be made to the tendency of the air to maintain a certain pressure. This pressure (measured by the barometer) is said to be 29.9 inches at sea level. In fact it may be more or less, and rarely does the barometer stand precisely at the normal figure. None the less, it oscillates about that figure, and tends to return to it. At any height above sea level, there will again be oscillations, with a different range and with a tendency to return to the new normal figure.

§ 4. By way of illustration and explanation, some of the disturbing causes may be briefly considered.

Most universal, perhaps, is lack of flexibility in supply. There never is complete ease of variation, such as to bring about the steady accommodation of supply to the precise quantity which will sell at the cost price. Even under the simplest conditions of handicraft production, there is no such flexibility. There is less as plant and machinery become more important and every considerable change in output involves time and expense. Though there is some flexibility in the output from an existing plant, it does not go far. Any considerable increase in supply involves the making of new plant, and any considerable decrease involves the abandonment of some of the old. Changes of this sort,

involving a readjustment of the preliminary investment, not only take place slowly, but are much affected by vague general sentiment. Business men, not much less than others, go with the crowd. When the belief gets abroad that such and such an industry is "a good thing," they flock into it with no very careful calculation. On the other hand, when affairs go ill, it is with reluctance that existing plants shut down. When the signs of increasing demand show themselves, new plants are at first constructed slowly and hesitatingly; then, at the later stages of a sustained increase, with uncalculating excess. Hence the oscillations of modern industry, often affecting many trades at once, and bringing in their train industrial crises.

The prices of things subject to rapid changes in demand are especially fluctuating, even tho they be produced under conditions approximating those of constant cost. Almost all textile goods that are used for outer garments are affected by the caprices of fashion. For textiles worn by women the changes in the demand are extraordinary. The stuff which is for the moment in fashion cannot be turned out as fast as the women want it; while that which was in fashion but a year ago can hardly be sold at any price. Amid such sharp changes in demand, supply cannot be easily accommodated, and the conformity of price to cost works itself out only as a rough sort of average.

The conformity of price to cost depends, of course, on the free competition of producers. So far as there is combination or monopoly, it does not work itself out. One of the most uncertain problems of modern industry is the extent of monopolistic combination — combination so effective that there is no longer even an approximate determination of price by cost. Large-scale production tends to limit the number of individual competitors, and facilitates monopoly conditions. But the change in this direction, striking as it has been in the last half century, has not gone so far as to displace competition over more than a limited range of industries.¹ Over the greater part of the economic field competition is still in force, tho often irregularly

¹ Chapter 4; and Chapter 65.

and spasmodically, and the tendency is still for the prices of things to conform to their cost.

An important obstacle to the play of competition sometimes arises from custom and good will — from brands, labels, trademarks. Where producers and consumers are separated by a long chain of intermediaries, the consumers often look to some external and familiar mark in deciding which among competing products they will select. Hence the immense part played by advertising. It is a familiar saying in business circles that it pays to advertise a good article. Certainly it pays, and sometimes pays enormously, to create and maintain good will. He who has induced many people to get into the way of buying a particular brand may sell at a price higher than that of his competitors, or sell in greater volume and with more steadiness. No doubt this sort of advantage does not come by accident. It is slowly created by shrewdness, patience, persistence. The profitability of a trade-mark is due at the outset to the business ability of some individual, and connects itself with questions, to be considered later, concerning the variations of gains among individual business men. In fact the whole problem of competition and cost is a fundamental one; it ramifies into all parts of economics; and all its aspects must be taken up step by step as we proceed.

Where production is on a large scale, a very slight difference in price, or change in price, may make a great difference in profit. In railway operations an extra twentieth of a cent in the charge per ton per mile may mean millions of dollars in revenue. In sugar refining, an extra tenth of a cent per pound on refined sugar means the difference between moderate gains and great gains. What is thus true of a difference in price, is of course true also of a difference in expenses: he who saves a tenth or twentieth of a cent per unit of output is on the way to fortune. Many of the great combinations which are supposed to make vast monopoly profits, and which in fact make unusual profits, do so by a very small margin. Price exceeds cost by only a fraction, but profits exceed the normal amount by a large total.

Those staple articles which are used regularly from year to year in much the same quantities are sold at prices which are surprisingly close to constant (*i.e.* uniform) costs. So it is with flour, with the ordinary kinds of cotton cloths and of boots and shoes. Here are businesses of cents: a fraction more or less means the difference between profit and loss. An able business manager, quick to introduce all improvements, will be turning out his goods at a cost lower by only a trifle than that of his competitors; or, having succeeded in making a reputation for a particular sort of shoe or a particular brand of cloth, he may get a price a trifle higher than others get. By either slight differential advantage he will make large profits. Other things are commonly sold with a wider "margin of profit"—*i.e.* a wider difference between expense per unit and selling price — because there is more risk, more irregularity, more balancing of possible losses against the expected rates of gain.

All these things need to be taken into account when it is said that price is governed by cost of production — a proposition which, to repeat, holds good only as a statement of a tendency, of an approximation to what would happen in a "static" state.

CHAPTER 13

VALUE AND VARYING COSTS. DIMINISHING RETURNS

Section 1. The equilibrium of value where marginal vendibility and marginal cost balance. The simile of the scissors, 177 — Sec. 2. Permanent variations in cost affect long-run value differently from temporary variations, 180 — Sec. 3. Diminishing returns, 182 — Sec. 4. Permanent variations, or diminishing returns, appear most in the extractive industries, 183.

§ 1. Let us suppose now that the several producers who compete with each other in putting a given article on the market have not the same facilities; that for some of them the expenses of production are greater than for others. We need not concern ourselves for the present with the question why there are such differences. Let us assume them to exist, and consider what consequences follow.

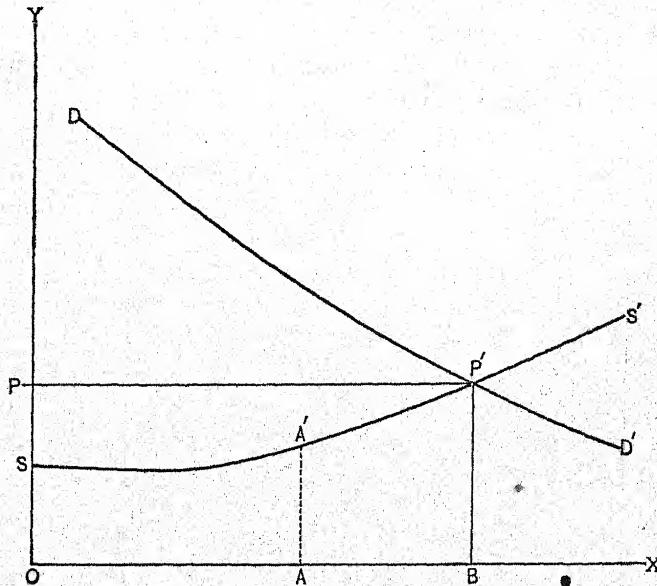


FIG. 6.

The situation is illustrated by the diagram. The conditions of demand are again indicated by the descending line DD' . The conditions of supply are indicated by the rising line SS' . The varying distance from the horizontal axis OX to the line SS' measures the varying cost of different installments of the supply. Some producers — those most favorably equipped — can put the commodity on the market at the comparatively low cost OS . Perhaps a certain moderate quantity can be so produced at constant cost. If the conditions of demand were such that only this moderate quantity were wanted at the constant cost price — if the demand curve were to intersect the supply curve somewhere near S — the normal price would be OS . So far the case would be identical with that studied in the preceding chapter. But now the conditions of demand, as indicated by the line DD' , are such that a much greater quantity is wanted at the price OS than can be furnished at that price. The supply put on the market increases, but as it increases, additional installments can no longer be produced at the cost OS . With the quantity OA , for example, the cost of the last installment reaches AA' . As more is produced, cost still increases, indicated by the continuing ascent of the supply curve from A' to P' . At P' finally the demand curve is met. At the price BP' ($=OP$) the quantity OB can be disposed of. Equilibrium is established; the quantity demanded equals the quantity supplied; and price settles at the amount BP' .

The whole supply will be sold at the price OP ($=BP'$); and the selling value of the whole, *i.e.* the quantity multiplied by the price, will be indicated by the rectangle $OPPB$. It is true that the more fortunate producers could sell the commodity to advantage at a less price. At the price OS or AA' they would still find it worth while to bring it to market. But the total quantity which will meet the demand at an equilibrium price cannot be supplied unless producers less fortunate contribute their quota. These will not do so unless they get their higher cost price BP' . At that price the whole supply will be disposed of. The more favorably situated producers will get the price necessary to in-

duce their rivals, who have poorer facilities, to contribute to the supply.

We may speak of the producers at B , whose cost of production is BP' , as the marginal producers. Their cost price is also the measure of the marginal vendibility of the commodity. Marginal cost and marginal vendibility thus coincide; and when they coincide, there is equilibrium. If the quantity supplied should increase beyond B , in the direction of X , marginal vendibility would be less, and marginal cost would be greater. Supply could not long be maintained beyond the point B , for producers would then be receiving less than cost. So long as the conditions of demand and supply remained as indicated by the lines DD' or SS' , price would settle at the amount BP' .

The relation of demand and supply to value is somewhat different here from what it was in the cases discussed in the preceding chapters. Where the supply of a commodity is fixed (the case which underlies the reasoning of Chapter 10), the value of a commodity is settled by the conditions of demand; that is, by the marginal vendibility of that supply. Where, on the other hand, the cost of a freely produced commodity is constant (the case discussed in Chapter 12), the value of the commodity is settled by the conditions of supply; that is, by cost. Demand in this case determines, in the long run, only the quantity which shall be put on the market. But in the case now under consideration, the conditions of demand and of supply both have a permanent influence in settling price. As the quantity shifts, not only does marginal vendibility vary, but marginal cost. A lessening of demand would not only lessen the quantity put on the market, but would also lessen marginal cost. Conversely, an increase of demand would not only cause more to be put on the market, but would also raise normal price, since the additional quantity would be produced at greater cost. Hence demand and supply — marginal vendibility and cost — mutually determine normal price.

The economist who has best set forth the general theory of value, Professor Marshall, has ingeniously compared the influence

of demand and supply to the working of a pair of scissors. If one blade of a pair of scissors is held still, and the other moves, we may say that the second does the cutting. Yet it could not cut unless the other blade were there. So when supply is fixed, we may say that demand settles value; yet it does so only because supply is there and does not move. When cost is constant, we may say that cost settles value. Yet it does so only because there is a demand for the commodity, and because supply readily adjusts itself to the amount which will be demanded at the cost price. If cost is variable in the manner discussed in the present chapter, both supply and demand — both cost and vendibility — exercise a mutual influence on normal price. Both blades of the scissors are in motion. All the various manifestations of value (under the conditions of an advanced division of labor and of exchange flowing from that division) can be analyzed as interactions of supply and demand. Neither can be said to settle value independently of the other.

§ 2. The differences in advantage between producers may be due to permanent or to temporary causes. According as they are temporary or permanent, they are of very different significance for the theory of value and for the welfare of society.

Differences of a temporary sort are the most common. They are so common that they may be said in one sense to be universal. As indicated in the last chapter, it probably never happens in communities familiar to us, that all those engaged in a given industry are carrying on their operations in the same way. Some have better plant, better organization, better location, than others; can bring their products to market at less expense; and, selling at the same price, can reap larger gains.)

But these differences, if their causes are not permanent, tend constantly to disappear. If one man has better plant or machinery than another, and if there be no permanent reason why the second should not also set up the better outfit, he is likely sooner or later to do so. If he does not do so, he is likely to be driven out of the market. Others will adopt the more effective method of production, will increase the quantity they put on the

market, and will be able to undersell him without foregoing a profit. Where the methods of cheapened production are open to all, they are sure sooner or later to be adopted by all.

We say, sooner or later; for the process takes time, especially when changes in the arts are rapid. The civilized world has been for generations in a dynamic state. Causes of differences are constantly appearing, disappearing, and reappearing. At any given time, the usual conditions are those not of uniform cost but of varying cost.

But under these conditions value cannot be said to be determined by marginal cost of production. Value is always determined proximately by the marginal vendibility of the supply. Given the total supply that comes on the market — whether offered in large sudden doses, or by gradual increments — and the price will be such that the whole is sold. For the marginal producer this price may or may not be equal at any given time to cost. With the oscillations of demand and the various other causes of nonadjustment to normal conditions which were considered in the preceding chapter, the season's price may be such as to make the marginal producer prosperous or such as to make him a bankrupt. If he becomes prosperous, his more enterprising and successful rivals, the infra-marginal producers, become even more so, and are tempted to extend their operations. If he is on the way to bankruptcy, they may yet be able to hold their own. In time he disappears and his better-equipped or better-situated rivals supplant him. In time, too, it is cost of production at their hands which acts on supply, and thus acts on price. In other words, disregarding temporary and seasonal fluctuations, the principle of constant cost regulates long-run value where there are non-permanent differences between rival producers. In such a case, it is cost of production at the hands of the more capable and better-equipped producers, not cost of production at the hands of the marginal producer, that settles the long-run price as distinguished from the market price.¹

The outcome is different where permanent causes underlie

¹ Compare what is said in Chapter 50, §§ 1, 2.

the varying costs of the several producers. Then cost at the hands of the marginal producer does settle the long-run price. The point about which oscillations range and to which price tends to conform is cost for the least advantageous producer. Without him, the total supply cannot be enlarged to the point at which there is an equilibrium of normal supply and demand.) If indeed there were no limit to the amount which the more advantageous producers could bring to market — if this fortunate set could increase the output indefinitely at constant cost — the marginal producer would be driven out, and the conditions would be those of constant cost. There being such a limit, he must be called on for the maintenance of supply, and there must be in the long run a price which will make it worth his while to contribute. (Value is then determined by cost to the marginal producer; but at what point in the varying scale of costs that producer will be, depends on the conditions of demand.)

§ 3. Instead of speaking of varying cost or increasing cost, we may speak of diminishing returns.

Increasing cost and diminishing returns are opposite aspects of the same tendency. Looking again at the diagram, we may see that the marginal producer at *B* has, for the same addition to the supply, greater expenses than the better-situated producers at *A* and *O*. As the quantity put on the market increases along the axis *OX*, cost for every fresh installment becomes greater. With every proportional increase in outlay, there is a less addition to the supply — a tendency to diminishing return.

It matters not whether we say that the tendency to diminishing return is experienced by the infra-marginal producers themselves or by those experienced producers whom we have regarded as marginal. Unless it were experienced by the former, the particular situation considered in this chapter — that, namely, of variations in cost due to permanent causes — would not exist at all. Those who are better situated may find, as they try to enlarge their several contributions to the supply, that they cannot do so on the same relatively easy terms as for the earlier installments: they encounter diminishing returns. Or this same difficulty may be

met by others, less fortunate from the start, who add to the supply. In either case there is an increase of cost as the supply is enlarged, and the price must be such as to make the higher cost worth while. The result remains that normal price settles at the point of cost of production for the last increment. It would be more accurate, therefore, to speak of the marginal product or marginal increment, than of the marginal producer, as fixing the long-run price.)

Tho we use the term "cost" in this series of chapters in the sense of outlays by a capitalist, and measure increasing cost by the increase in these outlays as additional supplies are brought to market, the cause of this rising cost is commonly an increase of cost in the other sense — cost in terms of labor, exertion, sacrifice, or disability.¹ When additional supplies of a commodity entail permanently greater expenses per unit to the producing capitalist, this result is usually due to the fact that more labor is required or a greater volume of capital. The distinction between expenses of production and cost in the sense of labor and sacrifice, tho it will be found of great significance for some problems, is not important here. (Where expense increases permanently for successive additions to supply — where returns diminish in proportion to outlay — we have also diminishing returns in the sense that the same labor yields a lessening output. That part of the theory of value which we are considering in this chapter has its foundation mainly in some unalterable conditions in the world about us, in the fact that nature enables labor to be applied less advantageously under some conditions than under others, and that the continued application of labor on even the most advantageous sites meets sooner or later a tendency to diminishing return.

§ 4. In what circumstances, and over how great a range of industries, do we find varying cost, or diminishing returns? (In general, differences in cost are permanent in the extractive industries — in agriculture, forestry, mining.)

In agriculture, good land yields more to labor than land less good. The prairies of Illinois are more fertile than the stony

¹ See Chapter 12, § 1.

fields of New England, the black earth of Russia than the sandy soil of Brandenburg. All the climatic factors — such as sunshine, precipitation, the length of the seasons — have their influence, as well as the physical and chemical constitution of the soil. Of these and their effects we shall have occasion to say more at a later stage; it suffices here to emphasize the obvious fact that there are differences.¹

Not only are there such differences, but there is further an unmistakable tendency to diminishing returns on any plot of land. The amount of produce which can be obtained from the best land is limited; and the amount which can be obtained from that land under the best conditions is limited. By applying more labor and capital, it is usually possible to add to the produce from a given piece of land; but it is not possible to get more produce in proportion to the addition of labor and capital. Hence there are permanent differences, not merely between different soils, but between the successive applications of labor and capital on the same soil. Agricultural production presents typically the application of the principle of value which we are now considering.

In forests, likewise, there are obvious differences of the same sorts. Some are better than others. Advantage in location and accessibility plays no less a part than advantage in the size and character of the timber; yet either kind of advantage counts. Mines present differences of an analogous kind; they are affected both by accessibility to the market and intrinsic productiveness. Both forests and mines have industrial peculiarities, especially in their development during very modern times; but of both, the general conditions of varying cost and diminishing returns hold good.

(In manufacturing industries, which shape and transform the materials brought out by the extractive industries, the principle of diminishing returns is applicable in less degree.) But, tho the differences in cost between competing producers are commonly of the transitional or "dynamic" sort, they sometimes have

¹ See Chapter 42.

permanent causes. One manufacturer may have more water power than others, or an unequaled site on a harbor front. In the earlier days of the development of power and machinery, a first-rate water power was of great advantage. Later, steam largely superseded water power; partly because of the great advances in the efficiency and economy of steam engines, partly because they could be set up at any desired place and so permitted better access to markets or to materials. In recent years the generation and transmission of electric power has again made falling water more important, and may prove the cause of enduring differences in the effectiveness of manufacturing establishments. In the main, however, the poorer establishments do not maintain themselves indefinitely side by side with the better. They are steadily displaced by the better, and these by the still better. The causes of difference are not as permanent, nor do they affect so many branches of production, as in the extractive industries.

CHAPTER 14

VALUE AND INCREASING RETURNS

Section 1. The equilibrium of supply and demand under increasing returns.

How the case differs from that of diminishing returns. Long-run results considered, 186 — Sec. 2. What industries show increasing returns. Causes of the tendency. External economies. Localization of industry; labor supply, 188 — Sec. 3. Internal economies, if continuing indefinitely, lead to monopoly, 190 — Sec. 4. Possibility of several points of equilibrium. Increasing returns commonly come slowly, but sometimes fast, 191.

§ 1. In the preceding chapter the theory of value was applied to the conditions of increasing cost or diminishing returns. We turn now to the reverse conditions, those of diminishing cost or increasing returns.

Suppose that, as additional supplies of a commodity are produced, the cost of each unit becomes not greater, but less. Such a tendency is represented in Figure 7 where line SS' , indi-

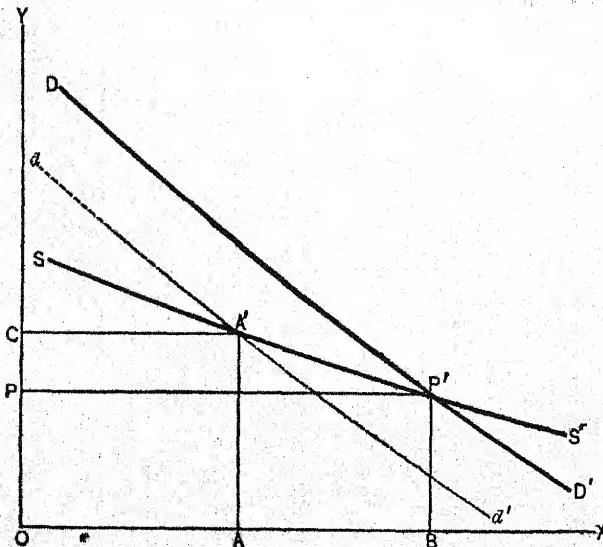


FIG. 7.

cating the conditions of supply, has a downward slope. The line DD' , representing the conditions of demand, necessarily has a downward slope, indicating the diminishing vendibility of successive increments. Equilibrium will be reached at the point where the two curves meet, at P' . At that point the quantity brought to market sells at the price BP' , which equals its cost of production. The total quantity put on the market will normally be OB , and its total selling price will be $OPP'B$.

It is to be observed that this figure represents a situation different in essential respects from that represented in Figure 6 in the preceding chapter. In that case some among the competing producers were supposed to contribute to the supply at less cost than others. They reaped a producer's surplus. In the present case, however, all producers are on the same plane; all have the advantage of lessening cost and increasing returns. No portion of the supply continues to be produced at a cost different from the marginal cost. With the supply OB , for example, the cost per unit of the commodity is BP' for each and every producer. If for any reason the supply should be reduced, cost for each unit would be greater. Suppose, for example, that demand should decline, the demand curve shifting to the left, to dd' , so as to intersect the supply curve at A' . The quantity normally supplied would then be OA , selling at the price AA' . All producers would find their cost per unit higher than when the quantity supplied was OB ; for AA' is greater than BP' . But at neither price would there be differences between producers. Total cost and total selling value in either case would be represented by parallelograms; at the price AA' by the area $OAA'C$, and at the price BP' by the area $OPP'B$. There is no such phenomenon as surplus gain to any producer.

This case differs, again, from that considered in the latter part of Chapter 12. There the effect of a general lowering of the supply schedule was considered, on the supposition that the reduction was due to some extraneous cause not directly connected with increase in supply. Here the reduction is supposed to be directly due to such an increase: the mere fact of greater

output brings a decline in cost per unit of supply. Cost, uniform for all producers, becomes less for each as more is produced.

All these three cases, on the other hand, are alike, in that long-run results are considered. Uniformity of costs, and the automatic decline in cost for all producers with increasing supply, never are found in industry. Where the conditions are favorable for a general decline in cost, some producers, as we have seen, take advantage of them more promptly than others; and so long as this "dynamic" situation continues, we have a lowering of cost for some producers, but not for all. This situation, however, will not endure: those who do not avail themselves of the improvements are underbid and driven from the market, and the "static" state of uniform cost is approached. The case would be different if those who had the better facilities were not subject to competition from others on even terms, and could not themselves increase their output indefinitely at lower cost. With such a limitation to their advantages, we should have precisely the case of varying costs, as discussed in the preceding chapter. Here cost is supposed to be uniform, but not constant — it becomes less per unit as the number of units increases. The long-run result is an interaction of demand and supply; both blades of the scissors are cutting.

§ 2. What now are the industries in which there is a tendency to increasing return, and what are the causes of this tendency?

The first question is comparatively easy to answer. The tendency appears in manufacturing, in transportation, in mining — in all the industries in which we have seen the tendency to large-scale production. In agriculture, tho it sometimes appears as a passing phase, it is not ordinarily found at all; and the same is true of systematic forestry. The greater the extent to which plant and machinery can be used, the more concentrated the industry and the smaller the area on which a given volume of production can be turned out, the more probable is the tendency to lessening cost and increasing return.

The second question calls for some discrimination. Increasing returns may be due to external economies or to internal

economies — again phrases suggested by Professor Marshall, and pointing to forces different in character and effect. Further, increasing returns may be due to changes in the arts, or may take place even without them. It is not always easy to separate those causes of increasing return which act under static conditions from those which act under conditions of progress in the arts. Yet it will make the subject clearer if at the outset we take up the two cases independently.

First, consider external economies. These are such as arise outside of the establishment which gains thereby in efficiency and in diminution of cost. An example at once simple and typical is the diminution in cost of machinery and adjuncts which takes place as these are made in larger quantities. The more cotton mills there are, and the more machinery they use, the larger the scale on which the machinery itself can be made. As the machinery becomes cheaper the expenses of the cotton manufacturer become less. Again, the construction of large steel ships in the United States was long carried on for a much smaller tonnage than in Great Britain. Consequently various adjuncts needed for ships — compasses, capstans, winches, donkey-engines, sundry vessel fittings — were called for in much larger quantity in Great Britain, were systematically and uniformly made on a larger scale, and were cheaper for the shipbuilder. These external economies would indeed have been at the disposal of the American shipbuilder if he could have bought such things in Great Britain without restriction. But the United States imposed on them a heavy customs duty. Whether procured from abroad or at home, they were therefore dearer. Still another example is in the boot and shoe manufacture. When this is carried on extensively, and especially when a number of establishments are in the same locality, subsidiary industries arise which supply cheaply the special tools, materials, and fittings — the shoestrings, eyes, metal fittings, the paper boxes for packing, not to mention the machinery. The gain in external economies of this sort is one of the reasons for the concentration of an industry in a given place; of shoe manufacturing in Brockton and Lynn, of silk man-

ufacturing in Paterson, of cotton manufacturing in Lowell and Fall River, of metal wares in Bridgeport. In every such place the factories, merely because of their number, command resources and economies which an isolated establishment finds hard to secure.

An important gain of this sort comes from the presence of a large experienced labor force. In almost every establishment the workmen are more or less shifting. The changes are more frequent in industries exposed to seasonal fluctuations, as the boot and shoe manufacture is, or to irregularities in demand, as in the case of establishments making machinery. They are less frequent where steady wants are supplied by staples, as in the soap manufacture, and where long-established businesses are conducted by firms of settled prestige. In many ways these shifts in the labor supply are unfortunate, yet seem to be an inevitable outcome not only of the variations in the demand for labor, but of the monotony of factory labor. Certain it is that workmen come and go, and new men must be found to replace those who leave. They are more likely to be found in manufacturing centers, and in centers where there are industries of the same sort or of similar sorts. No doubt there are drawbacks for the employer in such centers. His laborers are more likely to be organized in unions, and to press for higher wages; and the expense of urban sites needs to be considered.¹ But the fact that manufacturing towns grow shows that they offer net advantages. In an isolated establishment, the loss of a few skilled and trained workmen may cripple the whole. But in an industry which has grown to considerable dimensions, and which is concentrated in certain towns or districts, there is a general diffusion of skill in its various branches. The smooth and continuous conduct of operations is promoted by this external economy.

§ 3. Internal economies are those which arise within the establishment itself, and are independent of the general growth of the industry. All the gains from the extension of large-scale production (as distinguished from increasing volume of aggregate production) are of this sort — the gains from larger plant and

¹ Compare what is said in Chapter 43.

more effective power, from greater specialization of machinery, better handling of materials, more elaborate division of labor among the workmen, and more refined adaptation of each man's task to his capacity. One of the most interesting questions in regard to these advantages and their limits is the extent of the gain which comes from horizontal combination — from the union under single management of a number of single establishments each of which has developed within itself the more immediate internal economies. It is not certain how far horizontal combination leads, in the long run, to still further internal economies. Nor is it clear how far the other form of combination — vertical combination, or the integration of industry — leads to internal economies. It seems to do so beyond doubt in some of the great industries of modern times, especially in the iron manufacture. But in other directions it has not made such unmistakable progress. In most industries, the enlargement of the industrial unit beyond a certain point, whether in combination horizontally with similar units or vertically with related units, does not seem to lead with certainty to internal economies.

If internal economies were attained indefinitely as the scale of operations enlarged in each individual establishment, the stage would be eventually reached of complete concentration and complete monopoly. If each establishment, or each combination of establishments, found as it grew in size that its efficiency and its economies increased, the successively enlarging enterprises would undersell those rivals who failed to do so, and finally nothing would be left but one giant in sole possession of the field. This is the theoretically complete "trust," able to undersell all rivals by virtue of its economies in production. Such a trust has a monopoly, but evidently a tempered monopoly. Prices cannot be raised beyond the point at which producers who operate on a smaller scale can compete. If the rate at which internal economies accrue is slow — if the cheapening of production from each enlargement of the scale of operations is slight — this check on the power of the monopoly is substantial.

§ 4. In the first section of this chapter, the supposition was

tacitly made that there is only one point of equilibrium under conditions of increasing returns, and the Figure on p. 186 was constructed on this supposition. But a very little consideration shows that there may be two points of equilibrium. The demand and supply curves have the same inclination, and may

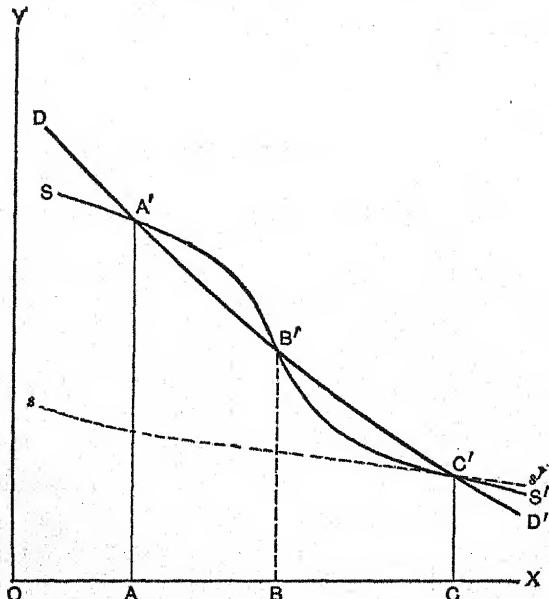


FIG. 8.

intersect at more points than one. The above Figure (Fig. 8) illustrates this possibility. SS' intersects DD' at A' , again at B' , again at C' . (Let the reader disregard for the moment the dotted line ss' .) A' is a point of stable equilibrium; so is C' . B' is not a point of stable equilibrium. It is true that the demand and supply curves intersect at this point. Immediately beyond B' , however, the demand curve is above the supply curve; demand price is higher than supply price. An increase of output beyond B would be profitable to producers, since the commodity can be sold, in the quantities between B and C , at prices higher than cost of production. But C' is again a point of true

equilibrium; since the supply price beyond C' is higher than the demand price, and an increase of supply beyond C would be unprofitable. Both A' and C' are thus, to repeat, points of stable equilibrium. Price might settle at either, and remain at either. It is indeed conceivable that a body of venturesome producers would extend supply beyond A , confident that cost per unit would decline unfailingly with increase of total output, and that eventually (after B was passed) demand price would again be above supply price. But the outcome of expansion of this sort must appear uncertain. If equilibrium were established at A' , it would presumably remain; yet if it were established at C' , it would also remain. Theoretically there may be an indefinite number of such points of stable equilibrium.

But tho there is this possibility of several points of equilibrium, actual conditions probably present very rare instances of the sort. A steep slope like that of the line SS' is less representative of what usually happens than a gentle slope like that of the dotted line ss' . Such a dotted line is likely to meet DD' but once (at C' , the third point of intersection for SS'). It is not widely different from the horizontal line which represents the condition of constant cost.

External economies are most likely to affect cost in the manner last described. As a rule, they operate slowly, almost imperceptibly, bringing a steady tendency toward lessening of expenses with increase of output, yet a tendency so gradual that for any given season or series of seasons the conditions differ little from those of constant cost.

Internal economies, on the other hand, sometimes are rapid in their introduction and operation. This happens especially when great changes take place in the arts, and when a new commodity is brought into use.

Changes in the arts and inventions, tho they do not necessarily affect either the total output or that of the individual establishment, yet commonly affect both. The cheapening of goods which results from improvements usually stimulates demand in considerable degree, causes the total output to be larger, and so

brings into operation external economies as well as additional internal economies. Improvements have commonly been in the direction of larger plant and more expensive machinery, greater division of labor, production on a larger scale. Not infrequently the arts have advanced so fast as to cause an abrupt diminution of cost, leave the equilibrium of supply and demand unsettled for years, and afford at least the possibility of more than one point of equilibrium. Bessemer's invention immensely reduced the cost of steel making; it also involved expensive plant and machinery; it gave great opportunities for large-scale production and highly elaborated organization; it thus led to very rapidly declining cost. The application of machinery to watch making has led to similar results; and in this case the commodity was one subject to a very elastic demand, hence with a possibility of multiple points of equilibrium.

New commodities, introduced suddenly or rapidly, often bring a strong tendency to decreasing cost with increasing supply. When first offered, they are strange to the buying public, must break the crust of habit, must wait for a readjustment of other devices and wants. Being thus marketable in small quantities only, they are produced on a small scale. As they become familiar and in wide use, the quantity that can be sold greatly increases, production on a large scale becomes possible, both internal and external economies are introduced effectively, and cost of production declines rapidly. The demand schedule for such articles often shows a high degree of elasticity, especially in the lower ranges, as the articles come into common use. The history of the bicycle illustrated this development: its slow introduction in the early stages, its rapidly increasing favor when once accepted and generally used, its rapid decline in cost and price when produced in larger quantities and on a larger scale. The automobile supplies an illustration no less striking.

Not infrequently it happens, however, that a new commodity is patented or in some other way falls under single control. This situation brings a new complication, arising from monopoly: the subject of the next chapter.

CHAPTER 15

MONOPOLY VALUE

Section 1. Monopoly affects price thru limitation of supply. This proposition qualified as to transactions between middlemen, especially as to producer's capital, 195 — Sec. 2. How price is fixed if a monopolist has a fortuitous supply; how, if he produces his supply at constant cost. Monopoly profit. Destruction of part of the supply possible, but not probable. Diamond mining as illustrating monopoly price, 198 — Sec. 3. Monopoly price under increasing returns. Copyrighted books as illustrations. Monopoly price under diminishing returns, 201 — Sec. 4. Possibility of varying prices under monopoly, usually disguised. Copyrighted books; telephone rates. Converse case of uniform prices under monopoly, 204 — Sec. 5. "Dumping" explained by monopoly, 207 — Sec. 6. Unqualified monopoly rare; various limitations and qualifications, 208 — Sec. 7. "Corners" (of a season's supply) do not *per se* affect price to consumers, but affect dealers and speculators. Some among the consumers may be affected by corners. Successful corners rare, 210.

§ 1. A monopolized commodity will be sold, by a person doing business for gain, on such terms as will yield the largest net revenue. We may assume, at the outset at least, that persons possessed of a monopoly act with shrewdness, and adjust their supply with intelligence and success so as to secure this maximum gain.

We say, adjust the supply; for this is the mode in which the monopolist can affect price and profit. The conditions of demand are beyond his control. When once the supply is settled and put on the market, the price at which it will sell depends on the play of demand. In this regard, monopoly value presents no peculiarities. (Its special problems arise in so far as the monopolist can make the supply larger and smaller at will.) With a given supply, put on the market *en bloc*,¹ the price will be the same whether it is in the hands of a single person or of several competing persons. There is some one price which measures

¹ See § 4 in this chapter for the significance of this qualification.

brings into operation external economies as well as additional internal economies. Improvements have commonly been in the direction of larger plant and more expensive machinery, greater division of labor, production on a larger scale. Not infrequently the arts have advanced so fast as to cause an abrupt diminution of cost, leave the equilibrium of supply and demand unsettled for years, and afford at least the possibility of more than one point of equilibrium. Bessemer's invention immensely reduced the cost of steel making; it also involved expensive plant and machinery; it gave great opportunities for large-scale production and highly elaborated organization; it thus led to very rapidly declining cost. The application of machinery to watch making has led to similar results; and in this case the commodity was one subject to a very elastic demand, hence with a possibility of multiple points of equilibrium.

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MONOPOLY VALUE

Section 1. Monopoly affects price thru limitation of supply. This proposition qualified as to transactions between middlemen, especially as to producer's capital, 195 — Sec. 2. How price is fixed if a monopolist has a fortuitous supply; how, if he produces his supply at constant cost. Monopoly profit. Destruction of part of the supply possible, but not probable. Diamond mining as illustrating monopoly price, 198 — Sec. 3. Monopoly price under increasing returns. Copyrighted books as illustrations. Monopoly price under diminishing returns, 201 — Sec. 4. Possibility of varying prices under monopoly, usually disguised. Copyrighted books; telephone rates. Converse case of uniform prices under monopoly, 204 — Sec. 5. "Dumping" explained by monopoly, 207 — Sec. 6. Unqualified monopoly rare; various limitations and qualifications, 208 — Sec. 7. "Corners" (of a season's supply) do not *per se* affect price to consumers, but affect dealers and speculators. Some among the consumers may be affected by corners. Successful corners rare, 210.

§ 1. A monopolized commodity will be sold, by a person doing business for gain, on such terms as will yield the largest net revenue. We may assume, at the outset at least, that persons possessed of a monopoly act with shrewdness, and adjust their supply with intelligence and success so as to secure this maximum gain.

We say, adjust the supply; for this is the mode in which the monopolist can affect price and profit. The conditions of demand are beyond his control. When once the supply is settled and put on the market, the price at which it will sell depends on the play of demand. In this regard, monopoly value presents no peculiarities. (Its special problems arise in so far as the monopolist can make the supply larger and smaller at will.) With a given supply, put on the market *en bloc*,¹ the price will be the same whether it is in the hands of a single person or of several competing persons. There is some one price which measures

¹ See § 4 in this chapter for the significance of this qualification.

its marginal vendibility — some one price at which the whole can be sold, and no more than the whole — and that price will rule.

This proposition, like so many in economics, needs to be taken broadly, as a statement of a tendency, not of literal detail; with precisely the same allowance for irregularity and imperfect adaptation that must be made for any general statement on values and prices. Most men in active business would at first blush deny it. They would say that a combination or monopoly can secure a higher price than competing persons can, even for the same supply. They know that a higher price can be obtained, in the first instance at least, from the middlemen, the wholesale or retail dealers, to whom the monopolist usually makes his direct sales. (When producers are competing, these dealers are very apt to play off one against another, and to induce the shaving of an offered price by threatening to turn to a competitor. No doubt, if all of the dealers do this successfully, competition among them will tend to lower prices in the end for the retail purchasers. At that final stage, it will appear whether the prices are such as to bring about the equation of supply and demand. But competition among dealers, and especially among retail dealers, operates with friction; and the lower prices which competition among manufacturers causes these to concede to dealers may redound for a considerable time to the dealers' profit, not to that of consumers. Conversely, (a monopoly may squeeze the dealers, so to speak; charge them higher prices, which yet they do not find it feasible — for some time at least — to pass on to consumers.) And even when such a rise in prices reaches consumers, the effect on their purchases is not immediate or automatic. If indeed the rise is great, and the demand for the commodity is elastic, a reduction in purchases will be prompt. The monopolist will find almost at once that he cannot sell the same supply at higher prices. But if the rise in price is not great, people will very possibly continue to buy for some time what they have been in the habit of buying. They may be uneasy and irritated by the higher charge, yet for the moment may not adapt themselves to

the new situation by curtailing their purchases. The monopolist may then hold the raised price for a while, even if it reaches consumers. Meanwhile, in a growing community, new consumers may be added, or the old consumers may get larger incomes. An increase in demand may overtake the higher price, and make it permanent; and then it will seem as if the mere fact of monopoly had caused prices to rise.

The position of middlemen as buffers, easing and delaying the pressure of the forces at work, appears even more strongly in the case of producer's goods. As has already been said,¹ the play of demand and utility is much modified in the prices of such things — iron, copper, timber, wool. (The connection between the price ultimately paid for finished goods by consumers and the ruling price for materials among dealers is often a slow and uncertain one.) Still slower is that between the materials for tools, like iron and copper, and the consumable articles which in the end the tools serve to make. Here there is a possible influence of monopoly on price which would not appear if the monopolist sold an enjoyable commodity directly to the consumers.

It is to be noted, further, that the first step taken by a monopolist is usually to settle his price, not his supply. The holder of a patent, for example, will offer the patented article at a given price; he will not usually determine in advance the amount which he will put on the market. If he finds that, at the given price, he can sell more than he expected, he will add to the supply. If he finds that he cannot sell so much, he will let the stock which he has on hand go off gradually, and in the future will add to it slowly and cautiously. In other words, (he experiments with the supply which he can dispose of at the price fixed; and perhaps, as time goes on, lowers or raises his price, according to the response from purchasers.) Probably he is only half conscious that his control over price rests on his control over supply; yet the shrewd business man is very rarely in doubt that this is the fundamental condition for keeping a price above the competitive level.

¹ See above, Chapter 10, § 5.

§ 2. The power of a monopolist over price being exercised, then, fundamentally thru his control over supply, let us examine further in what way the control is exercised.

The simplest case is that of a supply which has cost nothing — something in the nature of treasure-trove. Such a fixed supply, if put on the market as a whole, will fetch a given price. But the owner may reason that a less supply will fetch a higher price. If the demand be inelastic, half of the supply may fetch more than double the price, and so yield a larger gross sum. It will then be in the interest of the monopolist to destroy half the supply, and put on the market only the remaining half. If the demand is elastic, it will more probably be to his advantage to put the whole on the market. The price per unit, to be sure, will be lower than if only half were sold, but not so much lower as to make the gross yield less. It is usually to the interest of a monopolist to restrict sensibly the supply of a commodity subject to inelastic demand, and to be liberal with the supply of one subject to elastic demand.

Suppose next that the supply is not fortuitous, but is produced by the monopolist under the ordinary conditions, with capital invested, laborers hired, sundry expenses of production incurred. Then the monopolist will aim to obtain not the largest gross amount, but the largest net profit. And that net profit he will try to make larger than the usual profits of capitalists. It may be assumed that in any case the monopolist would be able to secure on his capital, by investment in other directions, interest at the usual rate; and that for his own labor of direction and superintendence he would be able to secure the reward usually accruing to labor of the same skill and assiduity. Those normal gains we reckon among the expenses of production, or at least not as due to monopoly. It is the excess above them that constitutes *monopoly profit*.

It is probable that few monopolists consciously separate their gains in this way. They rarely distinguish between monopoly profits proper and ordinary returns for their capital and labor. They simply rejoice that they pay dividends at twenty or thirty

per cent, or are able to be munificent on salaries to themselves and their associates. If closely questioned, however, they would soon distinguish the share in these gains which is due to monopoly alone. It is that share, monopoly profits in the strict sense, which now interests us.

If the monopolist produces his commodity under the conditions of constant cost, his calculation of net profit will be simple. Figure 9 will illustrate it. The cost of producing the commodity is there represented by the distance from O to C , and is the same whether a large or small amount of the commodity be produced; it is $OC = AC' = BC''$. The price at which any given quality will sell depends on the conformation of the demand curve DD' .

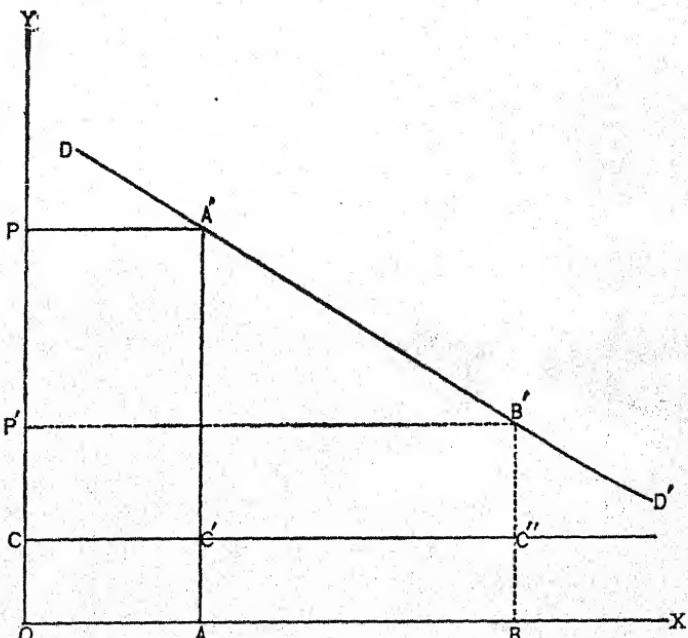


FIG. 9.

If a quantity OA is put on the market, it can all be sold at the price AA' . The total cost of this quantity is $OCC'A$. Monopoly profit will then be indicated by the area $CPA'C'$. But if the

quantity OB is put on the market, the price must be lowered to BB' , that being the price at which the whole quantity OB can be disposed of. Monopoly profit is now the area $CP'B'C''$. If the first area, $C'A'C$, is the larger of the two, it will be to the interest of the monopolist to restrict his output to the quantity OA . But if the area $CP'B'C''$ is the larger, it will be to his interest to enlarge his output to the amount OB . As has already been said, the elasticity of demand has an important influence on the calculations of the monopolist. If demand is elastic—if a lowering of price will greatly stimulate consumption and purchases—the line DD' will have a gentler slope, and the quantity which can be disposed of at the price OP' will be greater than OB . The parallelograms indicating gross receipts and monopoly profit will be longer, and larger in area. Under such conditions it is probable that monopoly profit will be larger for a comparatively low price than for a high one.

In the preceding section it was said that a monopolist might find it to his advantage to destroy part of a supply, in order to sell the remainder for a larger gross amount. But such destruction can take place very rarely. Fortuitous supplies, coming into a monopolist's hands without cost, hardly ever occur. When a monopolist's supply is produced and costs something, it is obviously easier and cheaper to refrain from producing a part of it than to destroy a part after it has been produced. Only from miscalculation or causes beyond control (such as superabundance of crops) may a monopolist find destruction to his advantage. It seems to be well established that in the eighteenth century the Dutch East India Company at times burnt part of its crop of cloves in order to be able to sell the remainder at prices so much higher as to increase its gross receipts. Similar destruction would hardly be ventured in a modern community; fear of retribution from an outraged public opinion would prevent it.¹

The mode in which a monopolist commonly proceeds in the

¹ When a publisher prints a limited edition of a book, and then distributes the type, he may be said to wipe out part of the supply in order to sell at a higher price the restricted portion which he prints.

adjustment of supply is illustrated by the conditions of diamond production in recent years. Virtually all new diamonds come from the mines at Kimberley in South Africa. These are under the single ownership of the De Beers Company, formed by an amalgamation, under the guidance of Cecil Rhodes, of a number of competing mines. Some of the mines are not worked, and the total supply is intentionally limited to the amount which can be sold to best advantage. The demand for diamonds, after a certain point, is highly inelastic. They are bought chiefly for purposes of display. Scarcity and high price are the basis of their utility; if very abundant, they would be little prized. Hence it is clearly to the advantage of the De Beers Company to curtail production and limit the supply.¹ Were the commodity one like copper, with a very elastic demand, it might pay such a monopolist to work the sources of supply to its utmost capacity.

§ 3. Suppose now that the monopolized commodity is produced, not under the conditions of constant cost, but under those of diminishing cost (increasing returns). The calculations of the monopolist then become complex. He must consider on the one hand the extent to which price will fall as a larger supply is put on the market, and on the other hand, how much cost will fall as more is produced. The situation is again easily illustrated by a diagram.

On Figure 10 DD' has a slight inclination, representing a very elastic demand. SS' , the supply curve, has a steep inclination, at least in its upper range, representing a very rapid decline in cost per unit as supply is enlarged. If the monopolist produces and puts on the market the quantity OA , he will find the cost per unit to be AC , and the total cost to be $COAC$. That supply will be sold at the price AA' ; the gross receipts will be $OPA'A$, and the monopoly profit will be $CPA'C$. If, on the other hand,

¹ The De Beers Company controls 95 per cent of the world's diamond production. See G. F. Williams, *The Diamond Mines of South Africa*, Vol. I, p. 291; Vol. II, p. 161.

Since the date of the first edition of this book (1910), the situation has changed somewhat. Discoveries elsewhere in South Africa have added to the supply, and the monopoly, while it remains effective, is in the hands not of a single producer but in those of a combination of a very few producers. The industry still illustrates the conditions of monopoly price.

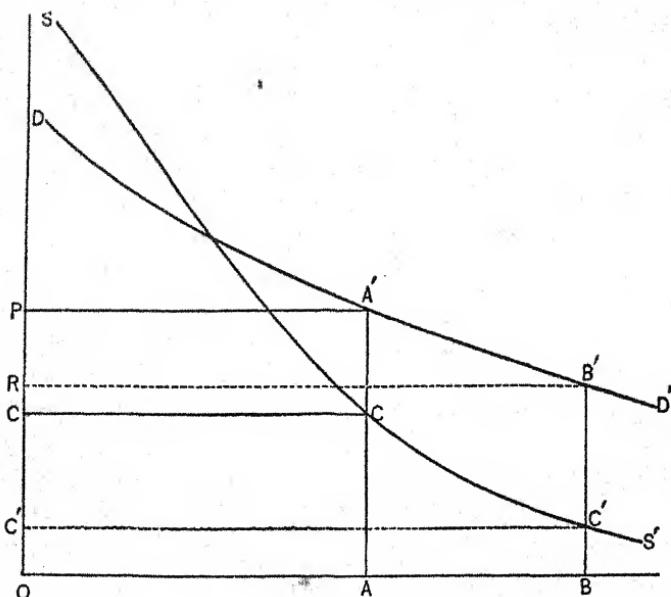


FIG. 10.

the quantity produced is the larger amount OB , the cost per unit will be only BC' , and the cost of the total supply will be $C'OB'C'$. That supply can be sold at the price BB' . The gross receipts will be $ORB'B$, and the monopoly profits will be $C'RB'C'$. Evidently the monopoly profit will be much greater with the lower price than with the higher price; this because the conditions assumed are those of very elastic demand and of rapidly decreasing cost. (The less elastic the demand, and the less rapid the decrease in cost, the more probable is it that the monopolist will find it to his advantage to limit the supply and keep up the price.)

The reader will easily see that a number of maximum monopoly profits and ruling monopoly prices are possible. To express in one single statement all the elements of the case would require mathematical formulation. Such a formulation, however, has an appearance of accuracy which is often misleading; and this is true even of a comparatively simple diagram like that given

above. Some of the elements in the situation must be more or less a matter of guess work for the monopolist; especially the degree of elasticity in demand, and the rate of decreasing cost with enlarged production. Even in the case of a perfectly unrestrained monopoly — and such are very rare — monopoly price is usually fixed by a sort of rule of thumb. Tho probably at a point considerably above the competitive price, it is not settled by any refined calculation of the precise point of maximum profit.

Sharply decreasing cost, or increasing return, is most likely to appear where articles are newly introduced. At first these are bought and used in small amounts. Later, as they become familiar and widely used, they are produced in larger quantities and the principle of increasing returns applies. Not infrequently new articles are monopolized, being protected by patent or copyright laws. They then give a most apt illustration of the working of the principles here under consideration. Thus, the Welsbach mantles attached to gas lights were long protected by patent in all advanced countries.¹ They enabled a much better light to be had for a less expenditure on gas, and they contaminated the air less. The demand for them was highly elastic. They were produced much more cheaply in large quantities. Hence, tho monopolized, they were sold at a price which, per unit of product, was not greatly above cost price; none the less, on the enormous quantity which could be sold, they yielded monopoly profits very great in the aggregate.

A situation essentially similar appears in the case of copyrighted books. Books conform to the principle of decreasing cost. The expense of typesetting and of making the stereotype plates is the same whether one thousand copies be printed or fifty thousand. The other expenses of bookmaking — paper, presswork, binding, and the like — are tolerably uniform per unit, yet some of them show slightly diminishing cost as more books are printed from the same plates. On the whole, the cost per unit is much less for a large edition than for a small one. A common device of

¹ This patent expired in the United States in 1906.

publishers is to issue a limited edition, often with numbered copies, and dispose of it at a high rate to collectors and other persons who prize the possession of a rare thing. They calculate that the profit will be greater from a small edition at a high price, than from a large edition at a low price. The same result appears with scientific books, which often appeal to but a small circle of readers and for which the demand is inelastic. The few copies printed are sold at a comparatively high price to those who desire them. Were they salable in large quantities, their cost and probably their price would be lower. On the other hand, new books which many people may be tempted to read — popular novels, for example — are sold at the outset for a lower price, for they present the conditions both of decreasing cost and of elastic demand.

It is obvious that under conditions of increasing cost (diminishing returns) the situation of a monopolist will again be different. (The probability of a sharp limitation of supply is evidently greater if the increase of supply entails greater cost for the additional output. If the demand be highly inelastic, the monopolist will certainly be disposed to restrict his output very much; for the price he can get will rise much with lessened supply, while his expenses will fall.) And even with an elastic demand, he will have to reckon, not indeed with rapidly falling price as output increases, but with some increase in cost. Monopoly, however, with diminishing returns is probably rare. It may appear in the case of some uncommon mineral products, obtained from a single source of supply or a few combined sources (the South African diamond mines possibly present an example). On the whole monopoly conditions, complete or partial, are much more likely to be found with commodities produced under constant or under increasing returns.

§ 4. Monopoly presents another possibility: different installments of the supply may be sold at varying prices. Under competition, one price prevails thruout the market; no one seller is allowed by the others to get a higher price. In the preceding paragraphs it has been tacitly assumed that the same holds good under monopoly. But it does not necessarily hold.

Look, for example, at Figure 9 (p. 199) representing monopoly

under the conditions of constant cost. The monopolist cannot but look with longing eyes at the possible profits represented by the area $CPA'C'$. It is true that the one uniform price yielding him the largest gain may be the price OP' ($= BB'$), at which his monopoly profits are $CP'B'C''$. But may he not get in addition the extra profit potentially to be had on the quantity OA , which would sell, if put on the market by itself, at the price AA' ? May he not charge a high price to the richer or more eager buyers, while selling at a lower rate to those not able or willing to pay the high price?

To sell directly and openly at varying prices to different purchasers is, to be sure, not always feasible or politic. There is the possibility of resale by the favored purchaser. Moreover, the instinct of equality or "fair treatment" is to be reckoned with. Its violation arouses a feeling of resentment, which may affect purchasers or lead to hostile legislation. Hence the monopolist, if he discriminates, is likely to disguise his discrimination. But in some degree he will not infrequently secure from the upper strata of buyers that higher price which would otherwise inure to them as consumer's surplus.

Thus the monopolist may put the commodity on the market in installments. He may sell at a high price first to those whose demand is keenest; and then, after a pause, put on the market a further supply at a lower price. Substantially this is often done by publishers with copyrighted books, especially such as are reasonably sure to have a considerable vogue. A first edition is offered at a comparatively high price. After a season or two, a much cheaper "popular" edition is put out, tempting a whole army of buyers for whom the first edition was too expensive. There is, indeed, some pretense of a difference between the two. The popular edition is printed on cheaper paper, has a less elaborate binding, or may be in paper cover. But the difference in cost between the two forms is usually small and by no means accounts for the difference in selling price. That difference results in the main from the publisher's effort to tap in succession the several strata of buyers.

Something of the same sort happens not infrequently in the case of patented articles. These may be sold at a high price for the first installments put on the market, and at prices much reduced as the great mass of buyers are sought. There is, to be sure, another factor, already referred to. Being patented, the articles must be of a new sort; since the law gives the monopoly, or patent, only on the ground of this novelty. The market is necessarily uncertain. The patentee is likely to proceed cautiously. The moderate quantity put on the market at the outset does not allow the advantages of large-scale production; hence, the price is high, cost also is high. If it were certain from the start that the article would find a wide sale, large plant and elaborate division of labor might be applied from the beginning, great quantities might be produced, a small part sold at once at high prices, the rest stored away until it was time to satisfy the demand at lower prices. But this involves risk. Commonly, the earlier installments are produced and sold tentatively, and the advantages of low cost are not reaped until the possibility of large sales at low prices is proved by successive experiments.

A direct instance of discrimination in price seems to be supplied by the telephone. This is a monopoly in most communities, and indeed, whether under private or public management, ought to be a monopoly. The commodity, or service, is not of a transferable kind; hence one obstacle to discrimination — possible resale — is out of the way. Telephone rates are commonly adjusted on the basis of what the user can pay; they are higher in cities and in thickly settled districts than in rural districts. Some parts of the variations in charges are doubtless due to differences in cost, but in the main they seem to be the outcome of monopoly conditions. This outcome is not necessarily objectionable; it might be reached under public ownership as well as under private; it is adduced here simply by way of illustrating the peculiarities of monopoly prices.

A converse case occurs when a monopoly charges a level rate to all persons, under conditions which would lead competing

producers to charge rates varying according to cost. Probably the uniform fare in American street railways could not be maintained but for monopoly conditions. Custom, convenience in collection, and a disposition to conciliate the public, account here for the one rate of fare which the monopoly charges. The most striking case of this sort, however, is where a public authority carries on an industry as a monopoly. The uniform rate of postage on letters is to be explained largely in this way. The two-cent rate is highly profitable on short distance letters, and especially on letters in the large cities. If competing producers carried on the business, some of them would enter this profitable part of the field and carry letters there for much less than two cents. Private individuals or corporations who might undertake letter service in outlying districts of thin population, especially the rural districts, would have to charge considerably more; or else the government would have to do the work at a heavy financial loss. The existing monopoly enables the government to cover the loss in one region from the profit in another. The postal service is administered at a very moderate uniform rate, either with profit as in European countries, or at a comparatively small loss as in the United States. The social and educational advantages of thus conducting the service, as a monopoly with uniform rates, are too obvious to need emphasis.

§ 5. The possibility of charging different prices to different purchasers explains the phenomenon of "dumping"—that is, the disposal of commodities in a foreign country at one price, and to domestic purchasers at another and higher price. In the absence of monopoly—that is, if producers were competing freely—all purchasers would get commodities at the same price. The producers might indeed gain collectively by selling part of the supply at a low rate and the rest at a higher. Where market conditions happen to be disadvantageous, and where the total supply cannot be sold on remunerative terms, there is a strong inducement to resort to such tactics. But no one producer will sacrifice himself for the benefit of the rest; he will not slaughter the whole or a part of his stock in order that others may gain.

If however all were to carry out an agreement to sacrifice each a specified share of his supply, reserving the remainder for higher prices, the object might conceivably be accomplished. Here, to be sure, there is this obstacle: a possibility that the favored purchaser may resell to those from whom it is proposed to exact the higher prices. But if the favored purchaser is a foreigner, and if a heavy duty on imports prevents him from sending back the "dumped" commodity to the domestic market, the obstacle is removed. The domestic price can then be kept higher, and the gain from this source may outweigh the loss on the dumped sales to foreigners; especially if the commodity be one for which the demand is inelastic and of which an increased supply on the domestic market would greatly depress the price. If the operation be carried on by a compact monopoly, it is possible that the foreign sales themselves will be at remunerative rates, and that the higher domestic price will yield monopoly profits still further enhanced.

The more complete the monopoly, the more likely will be inequalities in the nature of "dumping." Even in cases of half-way monopoly or temporary monopoly, something of the sort may happen, tho the discriminations will be less striking and less continued. Any producer or vendor of a "specialty"—a particular brand, an unusual commodity—is apt to be for a time in a position of semi-monopoly. So far as he controls the given article, he may find it advantageous to get rid of part of his supply in a foreign country, or in any out-of-the-way region in order not to "spoil" his domestic market. Where control of the market rests only on good will, or on established plant and reputation, the extent to which dumping can be carried is obviously less than in the case of a firm and enduring monopoly. Where on the other hand many producers are steadily competing in the sale of a staple commodity, dumping will not arise at all.

§ 6. Complete and unqualified monopoly is rare. Hence too much stress should not be laid on the theory of monopoly price in explaining the phenomena of actual life.

A monopoly exercised by a government for fiscal reasons gives

perhaps the best chance of exacting the full monopoly profit. When the Khedive of Egypt, in the days before the English occupation, maintained a monopoly of the salt trade, he probably squeezed out of it remorselessly all that could be exacted from his unfortunate subjects. But fiscal monopolies do not generally exercise their power to the utmost. They are not uncommon in civilized countries, being simply a method of securing public revenue by monopoly management instead of by taxes. Such are the tobacco and salt monopolies in Austria, Italy, and Japan, the tobacco monopoly in France, the spirit monopolies in Switzerland and Russia. These are rarely exploited up to their maximum yield. A given net revenue, varying according to the financial needs of the several states, is sought, and the adjustment of supply and of prices is pressed no further.

Patented and copyrighted articles, again, seem to fulfill the conditions of perfect monopoly; the law forbids competition once for all. But the holder of such a monopoly must reckon with the competition of more or less available substitutes, and thus is compelled to abate his prices and enlarge his supplies more than he would otherwise do. Copyrighted books, for example, must meet the competition of other copyrighted books of a similar kind, not to mention those on which the copyright has expired.) A first-rate textbook yields a good monopoly profit, sometimes a very high one. Yet if the price be put too high, others little worse can be used in its place. The gain from a copyrighted or patented article often arises not so much from selling it at a higher price than others of a similar sort, as from selling much more of it at about the same price. This gain is obviously the greater if the conditions of production are those of decreasing cost.

In other cases, also, of real or apparent or halfway monopoly, there are commonly checks. Many so-called monopolies lack a legal basis and even a solid industrial basis. Such is the case with most of the "trusts" which have been formed by horizontal combination. They must be ever on the watch against competitors, and very few, if any, are in a position to exercise un-

restrained monopoly power. Others, again, tho more securely founded, must be on their guard against regulation or displacement by public authority. Such are the so-called "public service" industries — the railway, the street railway, the telegraph, the telephone, the gas companies. Both of these sorts of cases, so important in modern industry, will engage our attention as we proceed. Here it suffices to note that the monopoly is in one way or another qualified.

Finally, the dullness or torpor of a monopolist must be reckoned with. The strict reasoning of the theory of monopoly price assumes him to press his advantage shrewdly and to the utmost. He may do nothing of the kind. The spur of competition — the one force which more than any other stimulates enterprise and business intelligence — is lacking. The secure monopolist is likely to be content with a good comfortable profit, and to let well enough alone. It may happen, indeed, that another and shrewder person will see the possibilities, buy out the inert possessor, and proceed to manage the affair with more vigor and profit. Such has been not infrequently the course of events in the public service monopolies of modern times, especially those whose possibilities of profit have been connected with changes in the arts and the rapid growth of great cities. But this is not a matter on which prediction can be ventured. The actual working of monopoly is often highly uncertain and irregular.

§ 7. It remains to say a word about one form of monopoly which frequently comes into public notice, the "corner." (This word usually implies not that the sources of production have come permanently under monopoly control, but that the available supply has been got for the time into a single hand. Recurrently persons of speculative bent try their hands at this operation, buying up the whole supply of an article, and then selling it, if possible, at a large profit.)

So far as the ordinary course of market prices is concerned, mere cornering has no effect. If supply remains the same, price to consumers will not be more or less because an article is in single hands. Yet the cornerer may make money. If so, this

is because he has foreseen more quickly or more shrewdly than others a shortage in the seasonal supply. By buying the whole of it at moderate prices from producers or dealers less shrewd he may profit by an advance. But that advance was certain to come sooner or later. The profit is not obtained at the expense of consumers. The question is simply which set of producers or middlemen will accurately gauge the market price of the season and profit accordingly. This is especially true of articles that are in consumable form, or very nearly in consumable form. Such is ice, the supply of which, in regions depending on natural (winter-frozen) ice, is absolutely fixed by the contingencies of the weather; or a vegetable like tomatoes, the crop of which, for canning purposes, has sometimes been bought out by speculators engineering a corner. The price of these things is settled with much precision by the play of demand and supply *i.e.* by marginal vendibility, and it matters not to the consumer whether that supply be in a single hand or not.

In the case of producer's goods, such as metals and raw materials the possible effect on prices from a corner is greater, for the reasons already indicated. Provided the corner is rigorous — provided all the available supplies and avenues of supply are effectively controlled — there is at least a possibility that middlemen and producers who are committed to operations in which the raw materials are needed, will be mulcted for a higher price than would rule without the corner.

Quite another situation appears when the persons against whose purses the corner is aimed are not the consumers, but other dealers and speculators, and especially the speculators who have been buying or selling for future delivery. Most speculators are simply betting on future prices. They are doing so, in the majority of cases, with incomplete or ill-interpreted information. A speculative corner is commonly directed against those who have sold for future delivery — that is, those who have agreed to sell for a given price, at a fixed date in the future, something which they do not own. A shrewd and daring person, or even one not shrewd but only daring, who believes that many

persons have oversold for future delivery, may try to buy up the whole supply available at the stipulated date. If he succeeds, he may then dictate the price at which they must buy *from him*, in order to keep their engagements; and the difference between that price and the price he has paid for his purchases makes the profit of the corner. Evidently the persons who are directly affected are not the consumers, but only other dealers and speculators. In so far, it is a case of diamond cut diamond.

Yet the consuming public is by no means without its concern in these speculative corners. Some of its purchases may be of a sort that cannot be postponed, and must be made at the ruling market price. This buying comes from those more eager or necessitous persons who would ordinarily get the article at the normal market price and would secure a consumer's surplus. During the crucial period of a corner — say during the month of May, if wheat for May delivery is the bone of contention — wheat will sell at an artificially high price. The cornerer is intent on buying every part of supply that comes to market, to prevent his opponents from getting the means of satisfying their contracts. These opponents, in turn, are under no less pressure to secure the supplies. Until the struggle is over — until either the corner "bursts" because the cornerer finds he cannot possibly buy the entire supply, or else the "short sellers" acknowledge themselves defeated and "settle" with their opponent — so long the market price is high, and those who are under the necessity of buying for *bona fide* use must pay accordingly. When the struggle is over, price goes back suddenly to the normal level for the season, or even below that level. Most consumers are no worse off than before, and sometimes are better off in consequence of the rapid disposal of supplies long withheld from the market.

Successful corners are rare. Usually those who attempt them underestimate the supply and overstrain their credit. (When the bidding of the contending speculators raises prices, all sorts of unexpected nooks and crannies prove to harbor scraps of supply that are hurried on the market to take advantage of the

golden opportunity; while the usual consumption is curtailed, and so far leaves more of the usual supply available. In order to hold the corner, enormous sums must be provided, always by borrowing on a vast scale, with hypothecation of what is already controlled; and the insistence of a large creditor may precipitate a collapse. Where the commodity is not, like agricultural products, the subject of seasonal cultivation, but is continuously produced, the difficulties in the way of a corner are even greater. In 1887-88 a noted attempt was made by a group of French speculators, headed by one Secretan, to corner copper. At once copper poured in from every part of the world, and all sorts of unknown or half-worked mines added to the product. The corner, after keeping up prices for many months, and causing disturbance and expense to those whose purchases had of necessity to be made during its operation, finally failed disastrously; its promoter was led to suicide, and a great French bank which had lent him large funds was compelled to suspend payments.)

CHAPTER 16

JOINT COST AND JOINT DEMAND

Section 1. Joint cost: effect of increase or decrease in demand. Influence of separable items of expense. "By-products." Complex case where both monopoly and joint cost exist. Influence of large plant, 214—Sec. 2. Joint demand. The constituent most limited in supply feels most the effect of an increase of demand. Labor in building trades as an illustration. Joint demand usually causes peculiarities less enduring than those arising from joint cost, 218.

§ 1. Not infrequently commodities are produced at joint cost; the same operations which turn out one in the group turn out another also. Such are mutton and wool; beef, hides, and horn; copper, gold, silver from ores containing these diverse metals; cotton fiber and cotton seed. Commodities produced at joint cost are of interest to us because of the peculiar problems of price which they present.

A perfect example of joint production is that of cotton fiber and cotton seed. To make the fiber marketable, the seed must be separated from it; all the expenses of cultivation and of ginning are necessarily incurred for the two together. But the prices per pound at which fiber and seed sell are very different. For every pound of lint (fiber) there are about two pounds of seed. At the prices of a five-year period (1903-08) the fiber sold at about ten cents a pound; the seed at about one half cent a pound. It may be assumed, with little divergence from the facts, that cotton is produced under conditions of competition, and that there is a large margin at which the cost is practically constant. Fiber and seed between them therefore sell, taking their average prices over a series of years, for what it costs to produce them. But the apportionment of this total price between the two joint products depends on the relative demand for them, or, in the terms which we have learned to use, on their marginal vendibility. The marginal vendibility of the cotton

fiber from a given crop is much greater than the marginal vendibility of the seed produced along with it; hence cotton sells at a much higher price per pound.

It follows that an increase of demand for a commodity which is produced jointly with another, may cause a fall in the price of that other. If the demand for cotton increases, its price will rise. This will not directly affect the price of seed, for which the supply and the conditions of demand remain the same. But the higher price of cotton is likely to stimulate production, and more both of fiber and of seed will be brought to market. The conditions of demand remaining unchanged for seed, its price must fall as supply is enlarged. Production will be increased until, in the end, the two between them will again sell for their joint expenses of production. But as the seed now sells at a lower price, the fiber must sell at a somewhat higher price; and the definitive outcome of the greater demand for fiber will thus be a larger output of both constituents. It will cause a higher price for the one and yet entail a lower price for the other. The opposite effect would follow if demand for one of the articles should become not greater, but less.

In most instances of joint cost, the situation is not so simple as this; for usually each article entails some separate items of expense. It is rare that, as with cotton fiber and cotton seed, all the expenses are incurred, to the very last stage, jointly for the two. The common case is more like that of wool and mutton; tho produced in the main at joint cost, each brings some special expenses of its own. The wool must be sheared; the sheep must be slaughtered and dressed for mutton. Wool and meat must each sell for at least the special cost connected with them, so a minimum price is set. In what proportion the remaining (joint) cost will be secured from the two will then depend on the play of demand, as in the simpler case of cotton fiber and seed.

The phrase "by-products" is often applied to denote some of the commodities produced at joint cost. When one of them habitually sells at a much lower price than the other, it is spoken

of as a by-product; or when a material for which no use has been known comes to be utilized and to have a market value, it is so described. Both reasons explain why cotton seed is commonly spoken of as a by-product, and not, as in strictness it should be, as a joint product. One of the most striking instances of joint cost is in the utilization of the various parts of slaughtered animals. The hide, the bristles, the bones, the horns, the hoofs, the blood, the various organs, all are turned to some sort of use — usually with items of special cost pertaining to each. As the meat is the most important and familiar product, the others are commonly called by-products.

The advance in the arts of production, especially under the influence of chemical science, has led to the utilization of many materials previously thrown away, and so has made the principle of joint cost of wider and wider application. Wool, produced at joint cost with mutton, further illustrates also this aspect of the principle. As wool comes from the sheep's back, it contains much fatty matter, which must be got rid of before the fiber can be used for textile purposes. This matter, formerly waste, has in recent times been extracted, in some degree refined, and has proved useful in treating leather and for other purposes.) Similarly, cotton seed, itself a joint product, supplies not only the oil pressed out of it (and that oil of various grades, serviceable for various purposes), but also the oil cake remaining after extraction, which is used as food for cattle. The slag which comes to the surface of the molten matter in a pig-iron furnace, and of which vast quantities formerly accumulated near the furnaces (some parts being perhaps turned to account locally as ballast under railway ties) has lately been used as a material in the manufacture of cement.¹ (Coal tar, one of the by-products from the making of gas and coke, has been found by chemistry to contain the materials for cheap and effective dyestuffs and also for important drugs.) The crude oil which comes from the coal-bearing strata, and which has formed so wonderful an addition

¹ In Germany the slag left by the Thomas and other basic processes is the most important source of supply of phosphorus used as fertilizer.

to man's resources during the last half century, is the basis of a number of products, having partly joint cost and partly special cost — kerosene (illuminating oil), naphtha, gasoline, lubricating oil, dyes, paraffin and candles, vaseline.

For the utilization of some joint products a large plant is indispensable; as in the case of wool grease or coal oil products. In so far, the advance of the arts has promoted the growth of large-scale production, and so has intensified the social problems which arise from it. Large-scale production, in turn, may lead to monopoly or largely facilitate it. Then another complication appears. Either monopoly alone or joint cost alone entails consequences for value which diverge far from the simpler cases. When the two are combined, a variety of interacting forces must be considered — joint and separate cost, marginal vendibility and elasticity of demand, monopoly and maximum profit, and the effects upon monopoly of possible competition, of public opinion and public regulation, and of inert management. The Standard Oil Company in the United States illustrates all these complications. It long had a more or less effective monopoly, due to various causes, among which large-scale production and the utilization of joint products have played their part; and these various joint products were marketed at prices influenced by all the factors mentioned in our discussion of monopoly, except probably that of inert management.

Whenever a very large fixed capital is used not for a single purpose, but for varied purposes, the influence of the principle of joint cost shows itself. Of this the most striking instance appears in the adjustment of railway rates — a case, however, so complex that its consideration is best postponed to a later chapter.¹ Where a large plant is used for producing one homogeneous commodity — say steel rails or plain cotton cloth — the peculiar effects of joint cost cannot, of course, appear. True, if such a plant, or combination of plants, has a monopoly or semi-monopoly, there may be varying prices for different portions of the one homogeneous product; there may be "dumping," as

¹ See Chapter 62, especially § 3.

in the case of steel rails.¹ But this is a very different phenomenon from that of value under joint cost.

§ 2. A different case from joint cost is joint demand, where what is wanted is not a single article, but a combination of articles. Thus a demand for dwellings is a demand for the completed accommodation. The purchaser is indifferent to the prices for brick, wood, glass, hardware; all he looks for is the house which combines these various materials.

If we suppose an increase in the demand for houses in a given district, and a rise in their prices, the change will be reflected in a rise in the prices of the several materials. If the materials were used solely for the construction of houses, and if they were put on the market under the same conditions — all equally limited in supply, or all equally extensible in supply — there would be no reason for expecting a greater rise in price for one than for the others. But the conditions of supply, as of demand, are likely to be different for the several constituents. Some may be easily obtainable in unlimited quantities at short notice; some may be temporarily or permanently limited. So far as any constituent is solely devoted to the given purpose and is limited in supply, so far is it likely to be peculiarly affected by the changes in demand for the joint product. Those constituents which serve other purposes also, and hence are on the market for miscellaneous sale, will be diverted toward the joint product by the increase in price; enlarging supply here will check in some degree the rise in price. If the supply of any constituent be unlimited and easily extensible at constant cost, its price will not rise at all. Supply will promptly respond to the new demand, and the effect of that demand will appear solely with the other constituents. And if all the constituents except one be easily procured in larger quantities, and if their supplies thus respond quickly to an increased demand, that exceptional constituent will get the full benefit of the increase in price.

The different kinds of labor needed in building operations, as well as the different kinds of materials, illustrate the working

¹ See above, Chapter 15, §§ 4, 5.

of joint demand. A demand for houses and business premises means a demand for all kinds of workmen — for unskilled laborers, for bricklayers, masons, and carpenters, for plumbers and electricians, and (in the case of high structures in American cities) for ironworkers. Some of these occupations are so widespread that an increased demand for a particular kind of labor in any one place easily draws an increased supply. This is most obviously true of ordinary manual labor — plain pick and shovel work. More of it can usually be got with little difficulty from other places. With the rougher kinds of carpenter's work the situation is similar. But it is different with the highly skilled trades and with those to which access is fettered by trade-union restriction. Here it is more difficult to add to the labor supply. Hence increased activity in building may have the effect of very greatly raising the wages of the workmen in these groups, while bringing comparatively little change for the others. Such a result has in recent years appeared frequently in American cities, strikingly so in New York. The rapid growth in urban population, combined with great improvements in building methods, has brought about astonishing activity in adding to and in remodeling dwellings and business premises. Certain kinds of laborers, not easily increased in supply by recruiting from other occupations or from other places, have been in insistent demand — such as plumbers, tile workers, electrical workers, house-smiths (*i.e.* structural ironworkers). These have felt more than the others the demand for the joint product, and have secured extraordinarily high wages. Artificial restriction of the supply by trade-union regulation has sometimes played no small part in securing for them an exceptionally larger share of the possible gain.

Ordinarily joint demand has not the same sort of permanent effect on value that joint supply has. In the long run, the conditions of supply are the more important in affecting value. Tho it is true, as appears most strikingly in the cases of increasing cost and of monopoly value, that there is a constant interaction of supply and demand, the dominant forces for most commodities are those of supply. Where an increased joint demand

affects most strongly some one commodity or some one kind of labor, because that happens to be the constituent whose supply is least easily extensible, there is none the less likely to be an increase in its supply. A readjustment of value takes place of the same sort as would have taken place if the demand had been not joint, but solely and separately for this one thing. If more brick is wanted, more will be produced; and an increased demand for houses, tho it may for the moment raise the price of brick, will not do so permanently. But the situation is different with joint cost; an increase in the demand for cotton fiber may have a permanent effect in lowering the price of cotton seed. The immediate effect of an increase of demand is usually greater in case of joint demand; but the ultimate effect is usually greater in case of joint supply.

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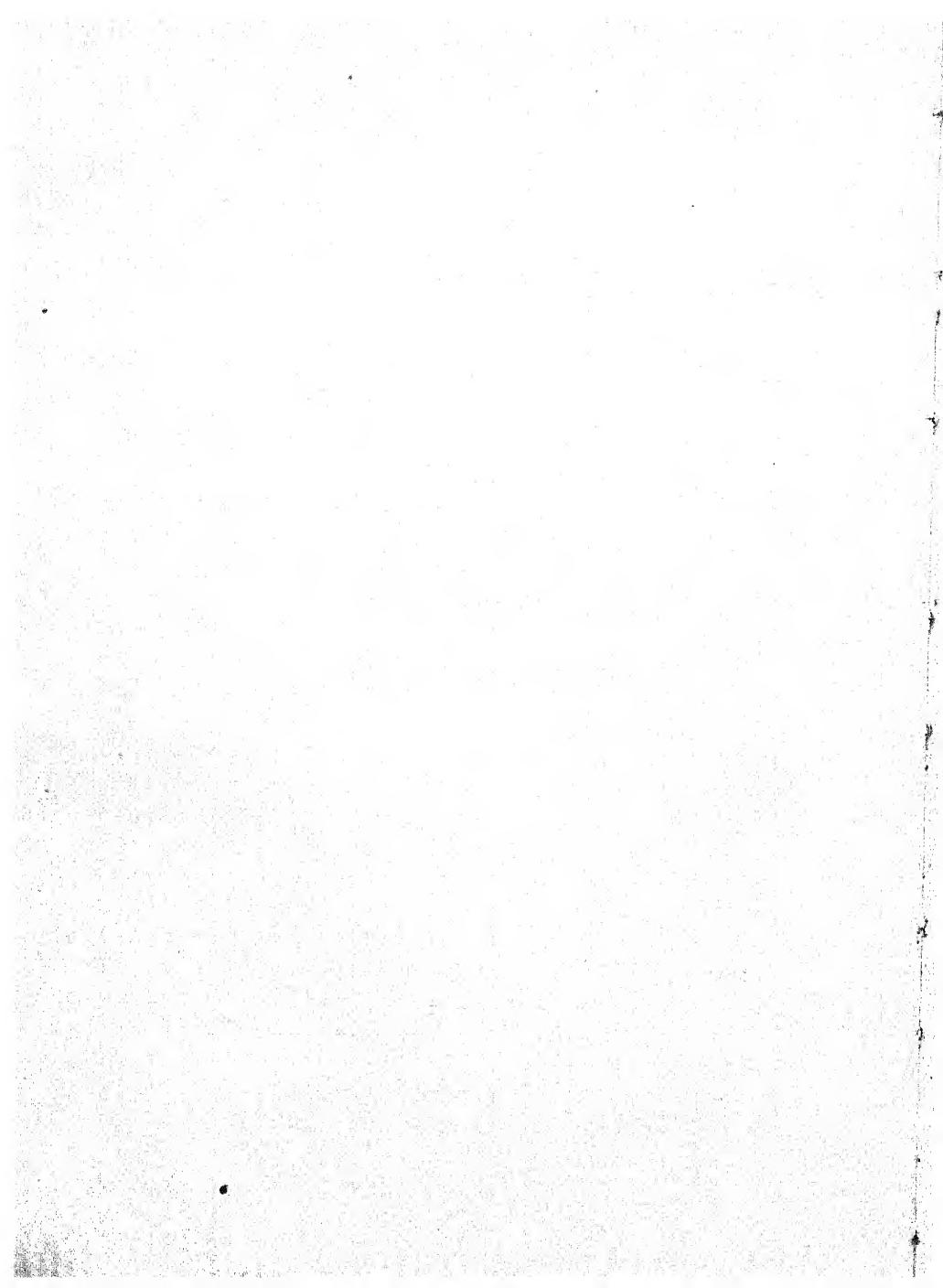
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BOOK III

**MONEY AND THE MECHANISM OF
EXCHANGE**



CHAPTER 17

THE PRECIOUS METALS. COINAGE

Section 1. The precious metals the main constituents of the circulating medium, 223 — Sec. 2. Qualities that have caused them to be selected for monetary use: luster, freedom from deterioration, limited supply. Their value and monetary use now rest largely on convention, 224 — Sec. 3. Coinage a public function. Free coinage; bullion and coin interchangeable. The mint price of gold, 226 — Sec. 4. Plentifullness of money is in itself a matter of indifference, 229.

§ 1. We have already considered the part which money plays in the division of labor.¹ (It is the medium by which exchanges are effected, and by which the consequences of the division of labor are worked out. It is the medium, too, in which the relative values of commodities are expressed.) At any given time, the price of a commodity registers its value. If iron sells for one cent a pound, and copper sells for ten cents a pound, their relative values are as one to ten. If the price of copper rises to twenty cents, iron remaining as before, their relative values become as one to twenty. But if iron sells for two cents, and copper for twenty, their values remain as one to ten; and what has happened is a change in their value relatively to the cents. A rise in both prices has taken place, which means a fall in the purchasing power of money; that is, a fall in its value. (Thus money, tho an accurate measure at any given time, is by no means necessarily an accurate measure for different times.) The most difficult monetary problems are those concerning the variations in its own value, that is, concerning the fluctuations in the general range of prices.

We have seen also that, while any commodity that is in general demand may serve the purpose of a medium of exchange, the most important by far have been gold and silver. Thruout most of the period over which the historical record extends, they

¹ Chapter 8.

have been the main constituents of the circulating medium. During the last century they have been supplemented to a high degree by paper substitutes or equivalents, and monetary conditions have been by this process profoundly affected. But specie¹ is still, and bids fair long to remain, the basis of the medium of exchange for all advanced countries. We can best begin the discussion of monetary questions by treating them as if specie were the sole constituent of the medium of exchange; introducing thereafter the several qualifications which arise from the use of paper money and of the complex credit instruments.

§ 2. Historically, the chief reason why gold and silver became the money metals was that they satisfied the craving for adornment. Things that minister to the deep-rooted love of display are in unfailing demand; and any commodity that is in unfailing demand may perform passably the functions of a medium of exchange. Hence the wide variety of things that have so served — cattle, grain, salt, furs, tobacco, and what not. It is the luster and sheen of gold and silver that caused them to be highly prized in the early stages of civilization, when other ways of producing these effects were not known. The glitter of the bauble is the origin of the monetary use of the precious metals; precisely as glass beads and scarlet cloth are serviceable for barter by explorers who push into those regions (now few) where savagery is still unaffected by the conventional ways of civilized man.

Other qualities contributed greatly to making gold and silver the money metals. They are singularly free from liability to deterioration. Rust does not affect them. They retain their luster with unusual constancy. Most important of all, they have proved to be sufficiently abundant for money use, and yet not so abundant that they have ceased to be prized. Any metal that is fairly scarce might be selected for monetary use. Iron was used in the early days of Rome. Copper was used to a considerable extent in later times; and it is still in use, though only under conditions that deprive it of much significance. In the

¹ I use "specie" to signify gold and silver used for monetary purposes, whether coined or uncoined.

course of time, both iron and copper have been discovered and produced in such great quantities that they have ceased to have any special value from their rarity. Gold and silver remain comparatively scarce. The common, and very widely distributed (gold perhaps most widely distributed of all), they are rarely found in large amounts, or under conditions which enable great quantities to be secured at small cost. It is true that highly productive mines have been not infrequently discovered, and during our own time new sources are being exploited to a striking extent. Some of these changes have had far-reaching effects on prices and on the modes of use for the two metals. Some of them, too, have caused the question to be raised, at one time and another, whether silver, or gold, or both, might not become so abundant and so cheap as no longer to be fit to serve as money. On the whole, however, their scarcity and high cost have continued. They now produced in quantities that are enormous compared with those of former centuries, their annual production is still very small as compared with that of iron, lead, copper, tin, and zinc.¹

The continued use of gold and silver for money rests very largely on convention, not on the intrinsic factors of beauty and scarcity. Once established as the money metals, they retain their position to a great degree by force of custom. (Anything which passes readily from hand to hand has value from its mere acceptability.) The strong influence of convention and habit is illustrated by the wampum of the American Indians. These strings of shells, originally sought because fancied for ornament, were in course of time accepted, without thought of their ornamental qualities, as a medium of exchange for the Indian tribes and

¹ The total production, the world over, of the more familiar metals was in 1900:—

	Metric Tons
Pig Iron	41,000,000
Lead	860,000
Copper	486,000
Zinc	471,000
Tin	85,000
Aluminum	7,800
Nickel	7,500
Silver	5,650
Gold	388

the early settlers. Among certain African tribes, tiny axes (called bikei) serve as the medium of exchange. It is clear that they are conventionalized survivals from a time when the purpose was served by real axes, which had the prime quality of general acceptability.¹ Paper money illustrates the same tendency. In the first stages of its use, it had to be really exchangeable on demand for specie; otherwise it would not be taken in payment. But once people were used to it, and accustomed to seeing it received by every one and paid out by every one, it could circulate as money with little reference to its convertibility into specie.² Specie has had for many centuries the established position which paper money has secured within very modern times. Just because all the world accepts it as money, it is peculiarly fit to serve as money.

Further, the fact that specie serves so universally as money tends to maintain its value, by giving it a utility for social prestige. Many of the non-monetary purposes for which gold and silver are used have become of minor importance. Brass and sundry imitations often do as well. Between the serviceability of plated ware and of solid silver there is no substantial difference. The one great utility which the sterling metal retains is like that of the diamond — it satisfies the love of distinction. The fact that gold and silver are used as money keeps up their value; the fact that they are valuable gives them utility for display; and this in turn serves to sustain their value for monetary as well as for non-monetary uses.

§ 3. Coins are stamped and certified pieces of metal. Uniformity, and consequent ease in reckoning prices, are made possible by coinage. The fact that the monetary metals can be split up into pieces absolutely uniform is one of the qualities which fits them for this use; tho, to be sure, it is a quality possessed not only by gold and silver, copper and nickel, but by other metals as well.

Coinage has been almost universally carried on as a public

¹ See Miss Mary Kingsley's *Travels in West Africa*, p. 320.

² See below, Chapter 23, § 1.

function. In all advanced countries it is now so carried on without exception. Conceivably, private persons might undertake it, the users of money being allowed to judge of the weight and fineness of the pieces as they are allowed to judge of the quality of the spoons and forks which they use. In this way silver is used to the present day as the medium of exchange in China. But the convenience of coins as the medium of exchange would be immensely lessened if every one had to ascertain for himself whether each piece was what it purported to be. Governments therefore reserve to themselves the monopoly of coinage, and punish as a crime the manufacture by private persons of money pieces. Historically, a strong reason for the public monopoly of coinage was the desire of kings and princes to make a profit by coinage operations, often dishonestly, thru intentional debasement of the coin.¹ In modern times, however, the monopoly is maintained because through it alone uniformity in the circulating medium can be assured.

Coin are so manufactured that they cannot be clipped or whittled without easy detection of the defect. Hence designs are always put on both sides, and the edges have corrugations (milling) or lettering. If the coins were simply round flat pieces of metal with smooth edges, shavings could be scraped or cut from them without easy detection. Such "sweating" was common in earlier days, before the art of coinage had been perfected. Modern machinery turns out pieces so skillfully manufactured that troubles of this sort have practically ceased.

Coin, again, are never made of pure metal. Gold and silver, without alloy, are soft, and coins made of them alone would wear out fast under active use. Hence a small percentage of base metal — usually copper — is added, the mixture giving the needed hardness and toughness. In most countries, gold and silver coins are 900 fine; that is, they contain 900 parts in gold or silver for every 1000 of gross weight. This is the fineness of the coins of the United States. Great Britain still coins her gold pieces

¹ For a modern instance of the same sort, see Slatin's *Fire and Sword in the Sudan*, pp. 541-543.

with a fineness of $916\frac{2}{3}$; that is, the proportion of alloy is not 1 in 10, but 1 in 12.

In the typical case, which alone we consider for the present, there is free coinage. That is, every holder of bullion may bring it to the mint, and no matter how much he brings, may have it converted into coin. The cost of manufacturing the coin is usually borne in modern communities by the public. When so borne, coinage is gratuitous as well as free. But the mint may return to the applicant coins containing a slightly less amount of specie than he presented. The difference retained by the mint then constitutes a charge to meet its expenses, in whole or in part. Such a difference or deduction is called a seigniorage (a name derived from the exclusive coinage rights of the king or feudal seigneur). Where a seigniorage is charged, the exchange value of coin may exceed to that extent the value of bullion. The mints of most countries, however, return to the person who presents gold bullion precisely the same weight of fine gold in the shape of coins. Sometimes, indeed, this return is not immediate; there is a delay corresponding to the length of time required for the manufacture of the coin. Thus in the United States a period of six weeks usually elapses between the delivery of bullion and the return of coin. Such a delay may cause the value of bullion to be slightly less than the value of coin, even tho there be free coinage without seigniorage, since there is a loss of interest during the period of waiting. These causes of divergence between gold bullion and gold coin — whether seigniorage or delay in coinage — have ceased to be of appreciable importance.

Not only can gold bullion be converted into coin at the mint without charge, or for a trifling charge, but gold coin can be readily converted into gold bullion, either by private melting, or by arrangement, common at the mints, for giving bullion in exchange for coin at fixed rates. The situation is very different with silver, copper, and nickel, which are not freely coined, and which present problems of their own. As regards gold, it may be said without substantial variance from the facts that bullion and coin are interchangeable.

The rate at which coin is given for bullion is the "mint price of gold." In England the mint price of standard gold is £3 17s. 10½d. per ounce; each ounce is manufactured into sovereigns at this rate. In France the mint price of fine gold is 3447.74 francs per kilogram, in Germany, it is 2790 marks per kilogram; the figures again indicating how many francs or marks are manufactured from the kilogram of gold. Because the amount of gold coin given for bullion never varies (so long as the coinage legislation remains unchanged), people often speak of the value of gold as unvarying. Accustomed to think of all exchanges and all values in terms of price, they think of the value of gold as the price (the mint price) of gold bullion. But obviously the purchasing power both of gold bullion and of gold coin is a very different matter. The value of gold depends on the general range of prices of commodities, or, rather it *is* the general range of prices; and this is by no means free from variation.

In the United States, the phrase "mint price of gold" is not often used, because our coinage legislation proceeds not by specifying what number of dollars shall be manufactured out of a given weight (say an ounce) of gold, but by specifying how much gold the dollar shall contain. The dollar is required to contain 23.22 grains of fine gold. Dollar pieces are no longer coined; they proved too small for convenient use; (five-dollar pieces are coined with five times this weight of gold, ten-dollar pieces with ten times the weight.) The mint price of gold, if that phrase were used with reference to our coinage system, would be \$20.67 per ounce.

§ 4. Before closing this introductory chapter, something may be said of the place which money and the mechanism of exchange hold among the factors that bear on the prosperity of a community.

Every person sells his wares or services for money, and commands the wares and services of others in proportion as he has more or less money.) It is natural to suppose that what brings prosperity to the individual brings prosperity to all. Yet a moment's reflection makes it clear that here, as so often, the inference is not warranted. If all persons sell their wares for more money, no

one gains thereby. The individual gains from having more money only if others have *not* more money — if he can buy from others at as low prices as before. If all prices and all money incomes are high, no one is bettered thereby. Money is the means by which each person procures the comforts and necessities of life; or, to speak more accurately, it is the medium by which each person exchanges the particular things he produces or owns for the various commodities which he wishes to buy. The more money there is, the more of this medium is used in every act of exchange. But prosperity depends on the abundance of the things exchanged, not on that of the counters used in effecting the exchanges.

This is so obvious that mere statement suffices for proof. None the less, it happens often that people who are half trained, and see only one aspect of economic phenomena, believe that abundance of gold or silver, or of paper substitutes for them, is the one thing needful to make the world better off. Many educated and intelligent persons, who would scorn to hold this opinion in its crudest form, yet hold some phase of it by implication. Thus, in connection with trade between one country and another, most people assume that such a state of foreign trade as brings money into the country leads to prosperity, while such a state as carries money out leads to adversity. All notions of this sort are shallow. The flow of specie into a country or out of it, in the course of international trade, is usually a matter of indifference. Where it is a matter of consequence, the mere increase or decrease in the supply of money is only the first step in a series of events that may affect the country's prosperity.¹ Whenever a person speaks of that which "brings money into the country" (or into the city or the village) as being good for it, the probabilities are that he has not mastered the elementary principles of economics. One of the simplest of these principles is that money is primarily an instrument for enabling the division of labor to work out its end with smoothness, and that, barring some niceties presently

¹ See the discussion of international trade especially in Chapter 32, and Chapter 36, § 1.

to be considered, it is a matter of no consequence whether the supply be large or small.

But tho the quantity of money and the consequent use of more or less of the counters in each operation of exchange be matters of indifference, the universal use of money in exchanges is by no means a matter of indifference. It has not merely the obvious effect of facilitating the division of labor and so promoting the output from the operations of production : it has ulterior consequences no less important. Without it neither merchants and traders nor manufacturers could carry on large-scale operations. All the phases of large-scale production, with its far-reaching social consequences, are dependent on a developed and smooth-working money régime ; it is indissolubly connected with capitalism and capitalistic enterprise. It underlies all lending and borrowing, all investment, the issue of corporate securities, financial operations of every kind. It has psychological effects as well as effects obviously economic. It affords a universal goal for the instinct of accumulation and possession, creating an environment in which every one strives for money, half forgetful of the purposes which the possession of money serves. All things are put in a pecuniary light, the proximate end of all effort is to make money, all efficiency and all product are measured in terms of money. Tho not the fundamental cause underlying the problems of the unequal division of wealth and income, it is yet a condition of the emergence of these problems in their characteristic modern forms : social classes distinguished by differences in money means, capital owned by comparatively few. While from one point of view money is the least essential part of the organization of production and distribution, it is from another point of view the one essential part. Without it, the characteristic modern problems could hardly be imagined.

CHAPTER 18

THE QUANTITY OF MONEY AND PRICES

Section 1. The value of money is inverse to its quantity, 232 — Sec. 2. Qualifications of this principle. Flow, or rapidity of circulation, of money and of goods, 235 — Sec. 3. Diversion of precious metals from monetary use thru consumption in the arts. Effects of rise and fall in prices; changes in industrial demand. Tendency to sharper separation of monetary and industrial use, 239 — Sec. 4. Diversion of specie from the monetary supply of Western countries by its flow to the East, 242 — Sec. 5. An increase in the supply of money does not ordinarily affect people's ways of using it, but may do so when barter is in process of being superseded by money exchange, as was the case in the sixteenth century, 244 — Sec. 6. The conclusions of this chapter, tho simple and provisional, hold good in essentials for more complicated conditions, 247.

§ 1. What determines the value of money? That is, what determines the general range of prices? The value of money obviously is high when the general range of prices is low; for a given amount of money will then buy much of other things. (Its value obviously is low when the general range of prices is high;) for a given amount of money will then buy little of other things. What, now, causes its value to be high or low, prices to be low or high?

The first step toward answering this question is to understand the relation between the quantity of money and its value. The fundamental relation is a very simple one. Double the quantity of money, and, other things being equal, prices will be twice as high as before and the value of money one-half. Halve the quantity of money, and, other things being equal, prices will be one-half what they were before, and the value of money double. That an increase in quantity tends to lower value, is a proposition holding good of all commodities. The special proposition concerning money is that its value tends to vary precisely in proportion to its quantity. This constant relation does not hold good of any other commodity. Double the quantity of wheat,

and its value will probably fall to much less than half of what it was before. Double the quantity of sugar, and its value will probably fall by no means to one-half. For both wheat and sugar, the outcome will depend on the elasticity of demand. But in the case of money, there is no question as to elasticity of demand, and no such difficulty in prediction. The value of money, under the simplest conditions, is exactly inverse to its quantity.

This is what is called the quantity theory of money. Concerning it a hot controversy has long waged. It has been vehemently denied; and often it has been erroneously stated. Rightly stated it conforms to the facts, but it must be rightly stated and understood. In the preceding paragraph it has been put boldly with the purpose to bring out clearly the fundamental truth. But the reader will note the phrases "other things being equal" and "under the simplest conditions." Great qualification and elaboration will be required before the bold statement can be made to fit the complicated phenomena of actual life, especially in modern times. The last word cannot be said until a long series of topics have been covered.¹ For the present, let us consider the essential ground on which the proposition rests, and some of the simplest qualifications.

These essential grounds are found in the nature of the demand for money.² People often say that the demand for money is without limit. They mean thereby that any individual desires to secure possession or control of as much as he can. But he desires possession or control as a means, not as an end. Money is not eaten or drunk or directly enjoyed. It is a means of getting other commodities; it is sought in order to be spent. We may set aside,

¹ See Chapter 31, at the close of this Book.

² "Demand" is used here in a different sense from that in which the term was used in Chapter 10, § 1. The demand for money, as spoken of here, means the quantity of commodities of all sorts which, being put on sale, are *offered* for money. Ordinarily, when speaking of a particular commodity and of the demand for it, economists mean by "demand" the quantity of that commodity which is *demanded*, not the quantity of another thing (money) which is offered for it. It is in this sense, of quantity demanded, that we construct the "demand curve" for a commodity. But as regards money we speak of demand in the other and simpler sense: what is offered in exchange for it.

as negligible, the case of the miser who gloats over money for its own sake, and also some other possible cases of hoarding. All the money, whether any individual has control of much or little of it, is spent sooner or later. The demand for it — what is offered in exchange for it — consists of the commodities on sale. But the commodities on sale are simply all the commodities that are to be exchanged. The demand for money, in any given community at any given time, is *constant*. It is not subject to change because of the greater or less range of prices. Whether goods sell for less or more, all of them will still be sold, and will still be offered for money. Hence, when there is twice as much money, the same number of commodities will be offered for the money, and prices will be twice as high as before.

In other words, using a phrase already explained,¹ the elasticity of demand for money is unity. Herein the position of money is unique. As regards the immense majority of commodities, demand is elastic in some cases, inelastic in others, but rarely so balanced that the same sum is always spent on any one. The case of money is peculiar in that the total amount of goods offered in the market — and this is what constitutes the demand for money — is not affected by its value. The total remains always the whole number of commodities that are exchanged. The total may indeed change; more of commodities may be produced, and more may be consequently offered in exchange for money; but more are not so produced and offered *because* the value of money is less. Extraneous causes, in this case as in others, may bring in a new factor. But given the same population, the same output of goods by that population, the same ways of selling and marketing — and this is what is meant when we say “other things remaining the same” — the demand for money is a constant sum.

This peculiarity of demand is not an accident, but the result of the very nature and uses of money. The elasticity of demand for cotton or for apples may happen to be unity. Some inquiries on the fluctuations in the prices of those articles have indicated that in fact such is approximately the situation, at least within

¹ See Chapter 10, § 2.

certain ranges of supply and price. But no one could predict it in advance; whereas a consideration of the very nature of money, and of the uses which money serves, leads to the conclusion that the demand for it is necessarily of this special character. The conclusion would not hold good of the precious metals when used for other purposes than coinage. If the demand for silver plate or platinum jewelry should prove at a given time to follow the same course, we should be interested, but surprised; there is no *a priori* reason for expecting the phenomenon. But in the case of money we cannot be surprised; the result is what must be expected.

§ 2. Let us now begin to introduce the explanations and qualifications of this fundamental principle. In the first place, we should not speak of the whole number of commodities, or even of the whole number exchanged; but only of the number exchanged thru the medium of money. Some goods are consumed by those who produce them, and do not enter the circle of exchange at all. Such are agricultural products consumed by those who grow them. These evidently do not constitute at any time demand for money. But with the growing elaboration of the division of labor, the proportion of goods so used tends to become steadily less. In a country like the United States at the present time it is not far from the truth to say that all things that are produced are exchanged.

Nor is it far from the truth to say that the exchange of things takes place solely thru the medium of money — to say that all things exchanged are sold for money and are thus exchanged thru money. True, there may be barter. The farmer may bring his eggs or grain to the country store, receive credit on the books of the dealer, and subsequently "buy" goods which are then set against his credit. (Here the transaction, tho in terms of money, is essentially one of barter. Probably the volume of transactions of this sort is not inconsiderable in the United States. Yet it is small in comparison to the total of transactions. Barter, such as this is, has disappeared even more than production for one's own consumption. What remains of it leads to no serious modification of the main line of reasoning.

Much more important is a qualification as to the rate or manner in which goods and money meet each other in exchange. The preceding statements seem to imply that all the goods are exchanged for all the money in one transaction. Obviously this does not happen. At any given moment, or on any given day, only a fraction of the goods is being sold, and only a fraction of the money is being used in purchases. Here, as elsewhere in economics, we should have in mind a flow rather than a fund. The total stock of commodities is indeed sold sooner or later, and may be conceived as a fund. But only a portion of it actually comes to market in any one day or week or other unit of time, the rest following in orderly sequence. There is a flow of goods into actual exchange. Similarly, the total quantity of money does not constitute a fund, but flows into actual use for purchasing goods in a tolerably regular sequence.

The phrase "rapidity of circulation" of money has been used to indicate this obvious fact. Of the total money actually on hand in a community a portion only is at any given time at work, so to speak. The money idle in our pockets does not directly influence and affect prices; only that which is buying goods at the counter does so. What proportion is at work depends on the habits of the people. It is affected by their geographical distribution and by the character of their industries. In a thinly settled agricultural section, where access to shops is not easy or frequent, a larger portion of the money is likely to be idle than in a thickly settled manufacturing or commercial section. The temper of the people is a factor. If they are confident of themselves — perhaps unduly confident, and thoughtless of the morrow — they are likely to spend money as fast as it comes into their hands, and let little of it remain idle at any time.

These remarks apply to the larger transactions of merchants and dealers as well as to the everyday purchases of consumers. Traders and producers always have on hand more money than they are using in purchases; the proportion depending partly on the nature of their business operations, partly on their temperament. The fact that these classes, in countries like the United

States, use not actual cash, but checks against bank deposit does not alter the situation; it only supplies another illustration of the difference between the fund of money and its flow. The total of their deposits in banks constitutes the fund; the checks by which purchases are effected from day to day constitute the flow. Thus we are anticipating in speaking of deposits and checks, whose use as substitutes for cash will be considered in due time,¹ it may be noted that the same principle are applicable to this more complex monetary medium as to money in its simplest form. In every form, the medium of exchange has its flow, or rate of use — its rapidity of circulation.

Similarly, goods have their rapidity of circulation. In more familiar language, they have their rate of turnover. This also depends obviously on a great variety of circumstances. It is likely to be rapid in a large city, slower in the country. It is affected, like the flow of money, by the temper of the people. It is likely to be quicker in an energetic and restless country like the United States than in a more slowly moving country like France. It varies in different parts of the United States. It varies, too, in different branches of trade. The turnover of a grocer's shop is more rapid than that of a hardware dealer's, that of a flour mill than that of a textile factory. Yet the flow of goods as a whole takes place steadily and continuously, and in a given community, with a surprisingly regular course.

Thus the proportion of money which is actually buying goods is not accidental; it is determined by the silent force of custom. It may be irregular for an individual, but over thousands and millions of individuals it follows a steady course. The flow of goods to market takes place at a similarly regular rate. Hence we may argue with confidence that if the total quantity of money be increased, that quantity which is used in making purchases at any given time will be correspondingly increased.)

Suppose, for example — to use an illustration of Mill's — that suddenly every one in the community has twice as much money. The only thing that can be done with it is to spend it.

¹See below, Chapter 24, § 3.

There is nothing to alter the habits of the people; nothing to cause a larger proportion to be kept in the pocket or in reserve.¹ The quantity of goods remains the same, nor is there anything to alter the mode in which people and dealers bring their goods to market. The flow of money will be doubled, the flow of goods unchanged, and prices will be twice as high as before.

The same effect which would ensue from a doubling in the quantity of money would ensue also from a doubling of its rapidity of circulation. If twice as much of the total stock is steadily in use for purchasing goods, the effect is the same as if the quantity were doubled without any change in the ways of using it.

The propositions which were laid down in the opening section obviously assumed that the quantity of goods, and the flow of goods into exchange, remain constant. So much was implied by the qualification "other things remaining the same." Needless to say, the quantity of goods does not always remain the same. (If it be doubled when the quantity of money is doubled, prices will be unchanged. If goods be doubled, money being the same, and the flow of goods to market unaffected, prices will fall one half. If the flow of goods to market — their rapidity of circulation — be so affected that twice as large a proportion of goods are regularly offered, prices will again fall one half.)

Rapidity of circulation is greater for money than for goods. To put it in other words, (the proportion which, at any one time, the money actually offered for goods bears to the total supply of money is greater than the proportion which the goods offered for money bear to the total supply of goods awaiting exchange) The reason for this difference is obvious. Money can always be used without delay in purchases; goods can often be sold but slowly. Money need never await for a buyer; goods must often wait for one. Many commodities have necessarily a slow turnover, as hardware and household furniture. Other things, like dwellings to let, warehouses, and factories, are in the market only by fractions or installments — only the utilities which they shed, so to speak, are being offered for sale — and their disposal

¹ See, however, what is said below, in § 5.

is sluggish. Money comes into the market quickly. Then there may be hoards, and occasionally an accumulation of unused money in the hands of people who are getting larger incomes than they are used to, money in the main is kept at work briskly at a rate greater or less for any given time and country according to the ways and customs of the people.

These various corrections and qualifications of the fundamental principle the reader will hereafter be supposed to bear in mind. Still others remain, and will be noted in due course; but the simplest and most necessary, as just stated, should be borne in mind from the start. When the value of money is said to be determined by its quantity, the meaning is that, if other things remain the same, an increase of the total stock of money brings a corresponding increase in the flow of money used in making purchases and adds correspondingly to the money offered in exchange for commodities.

§ 3. Let us proceed now to inquire how far the monetary supply of gold and silver is different from the total supply.

The precious metals are used in the arts as well as for monetary purposes. But the demand for them in the arts follows no such special law as does the demand for money. Utility, or satisfaction-yielding quality, determines the demand for gold trinkets and implements in the same irregular way as it determines the demand for wheat or sugar. The effect of an increase of supply on value is unpredictable; the elasticity of demand may show any scale of gradation.

If the same proportion of the total supply of gold and silver were always used in the arts, this difference between the monetary and the industrial demands would be of no consequence for the theory of money.) But that proportion is not necessarily the same. To a certain degree it is influenced by the very value of the monetary supply.

If, for example, prices and money incomes in general should go up, in consequence of greater abundance of gold, gold bullion would not advance; since, as we have seen, gold bullion is always at the same price in terms of coin. The raw material for

gold jewelry, spectacles, and the like, would be as cheap as before; such goods would advance in price only so far as the expense of manufacturing them from the bullion would be greater. Relatively to money incomes they would be cheaper than before. This greater cheapness would almost certainly cause more to be bought than before, and a greater proportion of the bullion would be diverted into the arts. A scarcity of gold, and consequent fall in prices and incomes, would tend to have the converse effect. Gold articles would be relatively dearer, and presumably would be bought in smaller quantity than before. The industrial consumption would divert less gold from the mint.

Even without a rise or fall in the value of gold (*i.e.* in general prices), changes in habits and tastes affect its industrial consumption. Gold jewelry may become more fashionable, gilding and gold leaf more in vogue, gold spectacles may be thought more convenient or becoming. A greater proportion of the available stock will then be removed from the monetary supply.

Of these two sets of causes, the first seems to have less effect than the second. Changes in general prices rarely occur on such a scale as to bring about considerable results of the sort stated. The price of jewelry and other gold articles is affected not only by the price of bullion, but by the expenses of manufacture. These expenses fluctuate in correspondence with changes in general prices. If all prices go up, that of the bullion will indeed remain the same; but wages and other items of outlay in manufacturing jewelry will go up as other goods and services do. An advance of twenty-five per cent in general prices is a very marked one. Yet such an advance would mean, not that gold articles would remain unchanged in price, but only that their prices would lag somewhat behind the general advance. They would go up perhaps twenty per cent, instead of twenty-five. The effect on their consumption would probably be small.

The second factor that bears on the industrial use of the metals — changes in habits and fashion — seems to be of more importance. The great growth of wealth during recent times has led to a larger use of gold in the arts; precisely as it has led to a larger

use of diamonds. Not until recent years was any methodical attempt made to ascertain the extent and growth of this use. For the decade from 1880 to 1890 the industrial consumption of gold (including export to the East, of which more will be said presently) was estimated to be, in terms of dollars, about \$60,000,000 a year. In 1912 the amount was supposed to be triple — about \$174,000,000 for that year. Some part of this reported increase was no doubt due to insufficient counting in the earlier period, but none the less, an increase there undoubtedly was. The change was by no means in proportion to that in the total production of gold, which was about \$100,000,000 a year in 1880-90, and no less than \$460,000,000 in 1912. In the earlier period, more than half of the gold produced was diverted from the monetary use of Western countries; in the later year, less than two-fifths was so diverted.

The total stock of gold in the world was estimated in 1900 at about \$9,000,000,000, of which something more than one-half was in use as money, the rest in use for the arts. What is in use for the arts may be regarded as practically lost from the monetary supply. Some part of it, no doubt, returns sooner or later to monetary channels; for plate, jewelry, and the like are sometimes melted and perhaps are then coined. But most of it is definitively lost. Whatever part returns has been little influenced by the value of money. Changes in fashion and habits chiefly determine the remelting, just as they chiefly determine how much shall go into the arts in the first instance. In the main, the use of the precious metals in the arts goes its own way, leaving for the monetary supply the annual accruing surplus of production over and above the independent industrial consumption.

This separation of industrial from monetary use is more complete at present than it was in earlier times. In medieval Europe a link might be cut from a gold chain and used in making a payment; and the cavaliers melted their plate freely to supply funds for the Stuarts. In British India, where conditions have remained in many ways medieval, the silver ornaments of the natives and their rupees were interchanged constantly and freely; and not-

withstanding the new position of the rupee since 1893,¹ they still remain to a certain degree interchangeable. Even in advanced countries some shift from monetary to industrial use takes place to this day; but, as has been said, there is an increasing tendency to sharp demarcation and to the settlement of the industrial use by independent causes.

The industrial consumption of silver has shown, like that of gold, a marked growth in recent times. In the United States it seems to have more than quadrupled in the period between 1880 and 1906.² This change, like the other, was due in large part to increasing wealth and to a fashion for silver plate and trinkets. No doubt it was due also to the lower price of silver. During the period just mentioned the price of silver was cut in two. The contrary movement during the war of 1914-18 — a sharp rise in price — tended to check again the growth in its industrial use. But the case of silver is different in one important respect from that of gold. Silver is no longer a freely coined metal; it does not become money in the same way as gold. Silver bullion, like tin or copper, has its price in terms of gold, and its use in the arts is affected by price thru the same mechanism as tin and copper. The use of gold is affected, as we have seen, thru the more obscure and unfamiliar influence of fluctuations of general prices and in general money incomes.

§ 4. Still another diversion of gold and silver from monetary use is important for the countries of Western civilization. This is the drain of specie to the East, which has been going on for centuries, and seems likely to continue for a long time in the future.

In the trade between the West and the East, and especially that between Europe and India, as far back as we have any definite knowledge, the merchandise sent from the East has exceeded in money value that sent in return from the West. A balance has remained steadily due to Eastern countries, and has caused

¹ See below, Chapter 21, § 5.

² In the United States, it seems to have been less than five million ounces a year in the early eighties, and over 20 million ounces a year in 1902-06. See the Report of the Director of the Mint on the *Production of Precious Metals*, 1906, p. 27.

a steady flow of gold and silver, and especially of silver, to go them in payment. The excess thus due has sometimes increased sometimes diminished. It has fluctuated with the variations demand for the several commodities exchanged between the two regions, with the accidents of seasons and crops, with the appearance of new articles of export on either side. During the closing years of the nineteenth century the balance to be paid by Western countries tended to decline. During the first decade of the twentieth century, on the other hand, it rose sharply. A balance to pay there has been for centuries, and still is. Hence specie steadily flows to the East.

This specie is lost to the Western countries as if it had been absorbed once for all in the arts — almost as if it had been dropped into the sea. It disappears from the monetary and industrial supplies of Europe and America. India — chiefly British India — has been aptly described as a sink, into which flow gold and silver, and especially silver, never to return.

The explanation of this complete diversion and almost disappearance lies in the unusual economic conditions of India; conditions which are found in other parts of the East also, though nowhere else so strikingly. China is in a somewhat similar situation, and Japan formerly was; but India, and especially that part which is now British India, has played much the most important rôle in this curious monetary experience. The region has long had an enormous population; in 1900 some three hundred millions. This population is mainly agricultural; it is ignorant and stolid. It uses metallic money almost solely — very little paper money or other substitutes. The rapidity of circulation of its money is low. Moreover, the people are given to the use both of gold and silver for ornament and for hoarding. The bracelets, rings, and jewels serve to gratify vanity in the present and also to store purchasing power for possible want in the future. Hence great amounts of specie can find their way into India, and remain there, without much effect on general prices; indeed, for long periods, without any measurable effect at all on prices. No such steady inflow could well take place into a Western

country without influencing prices. As will be seen when the subject of international trade is reached, a continued large absorption of specie by a highly organized industrial community is not possible. A large inflow will raise prices; this will tempt imports and check exports; then the flow of specie in payment for excess of exports will cease. But in a country like India the response of prices to increasing specie supply is very slow indeed. In the course of generations, it is true, a response will be found. During the latter part of the nineteenth century, prices and money incomes in the East went up, not to a marked degree, but appreciably;¹ but during the preceding centuries the upward movement, tho probably there, had been so slight and slow as not to be clearly discernible. The loosening of old bonds of caste and custom, the growing habituation to security of property, the opening of railroads, have much affected the industrial and monetary situation. But it still remains true, and will probably long continue so, that great quantities of the precious metals steadily flow to the East, to stay there; affecting prices and the value of money, it is true, but so gradually that the flow is rarely checked, and is resumed with new force whenever a large new supply is added to the stock of Western nations, or whenever the demand for Eastern commodities causes an upward movement in their export.

§ 5. In one important case an increase in the supply of money may affect its mode of use and so introduce a new factor. This is where an added supply facilitates a transition from barter to a money régime. This sort of case cannot occur when once exchange by money is fully established—when all goods and services are sold for money. Then an increase in the quantity of money means simply that two gold or silver pieces, or five, or ten, are used where one had been used before. Adam Smith supposed this to have been the only important consequence of the increase in the European supply of specie which came in the sixteenth and seventeenth centuries from the American mines.² Gold and

¹ See a paper by F. J. Atkinson, on "Prices in India, 1870-1908," in *Journal Royal Statistical Society*, September, 1909. In later years, and particularly during and after the war of 1914-18, the upward movement became more pronounced.

² Compare what is said of this great change in the next chapter.

silver plate indeed became thereby more plentiful — "a real convenience, tho surely a very trifling one." For the rest, Adam Smith goes on, "in order to make the same purchases, we must load ourselves with a greater quantity of gold and silver, and carry about a shilling in our pocket when a groat would have done before." But this was not the only change that took place. The greater plenty of specie contributed to its use in transactions previously effected without it, and caused still other transactions (exchanges) to be carried on which before had not been carried on at all.

The period (about from 1550 to 1650) was one of great industrial transformation. The economic régime of the Middle Ages was being rapidly displaced. Under that régime, the division of labor and exchange had been much limited, and a large proportion of the exchanges and payments that did take place were effected in kind — that is, by barter, not in money. It is conceivable that the break-up of such a situation, and the substitution of a complete monetary régime, should come about without any change in the supply of money. This would mean that the same supply must suffice for a larger number of transactions, and that prices must go down. But in communities so tied by custom as were those of Europe at the time, this process could have taken place, if at all, only with the greatest difficulty. The mere absence of a supply of a specie adequate for carrying on a larger volume of transactions without a great lowering of prices was an almost insuperable obstacle to the extension of monetary exchanges. The new specie vastly facilitated the transition. (It supplied a lubricator, so to speak, for the smooth and rapid working of the more effective machinery of exchange.) It penetrated quickly and easily into all western Europe, and made possible a much wider adoption of money payments; not only without the distress, real or fancied, that lower prices bring, but, thru the abundance of the supply, with markedly higher prices. Thereby the division of labor was extended into many new industrial fields, and the ease of exchange was made greater in many fields where such a division was already practised. A real ad-

vance in the efficacy of production was secured, and a real gain in welfare.¹

None the less, Adam Smith's view, tho historically incomplete for the particular case, was in principle sound. He wrote at a time when almost all people still had false notions of the advantages from the plentifulness of the precious metals. Being intent on disabusing them of such notions, he was led to overlook the real advantages which a community may secure from the easy procurement of a needed medium of exchange. But when once this medium of exchange has been procured, and when once it is in fully effective use, reasoning like Adam Smith's is not to be gainsaid. If ten times the labor were given to gold mining that is now given, and ten times the gold were thereby got, the world would not be better off; ten gold pieces would simply be used in every transaction where one is used now. The process of transition, to be sure — the change from lower to higher prices, or *vice versa* — would bring some important consequences of its own; but these would not affect the final outcome. Barring the transitional effects, it is immaterial whether prices are low or high, whether many tokens or a few are used to facilitate each act of exchange.

It has been suggested by some writers that there is still another way in which a process of adaptation to new conditions may affect the relation between the quantity of specie and its value; it may affect the monetary use directly. When money becomes more abundant, people, it is said, will use it less constantly. They will keep more of it in their pockets, use less in purchases. The merchant, too, will keep in his till a larger balance when money

¹ Some dim understanding of this fact — a groping toward a substantial truth — probably contributed to the over-importance attached to a plentiful supply of specie by the writers of the seventeenth century, and commonly by those of the eighteenth century also. But the beliefs of these "mercantile" writers were also much affected by the political power of those princes who, at a time when feudal dues were being replaced by money taxes and payments, and when the money dues were yet hard to enforce, had the command of plenty of specie. And mere confusion of thought further explains their attitude. Here, as on so many subjects, things which seem simple when once they have been cleared up, were long puzzling to men of high intelligence.

is plentiful than when it is scarce. But this in my judgment is not a probable result. There is no good reason to suppose that money will be used in a different way when there is more of it. If, indeed, the increase in quantity takes place under circumstances that destroy its general acceptability (as in the case of excessive paper money) the use of money and the demand for it will be affected.¹ But a mere increase of specie, or of other sorts of money enjoying general acceptability, will not affect its flow into use or lessen the effectiveness of each unit in the shaping of prices. Any individual, it is true, who gets a larger *share* of the total money on hand may thereby be led to change his ways of using it. A prosperous person ordinarily keeps a larger reserve of cash, in proportion to his income and his purchases, than one of slender means; and the rapidity of circulation of the money that goes thru his hands is less. But if all persons in the community have more money than before, so that its distribution among individuals and classes remains the same, the mode of using the circulating medium will not be affected. The same proportion will be applied to purchases in any given period, and prices will go up in proportion to the general increase in quantity.

§ 6. In this chapter, be it remembered, the principles underlying the value of money have been treated on the assumption that specie alone is used. This case is obviously very different from the complicated one which we find in the actual conditions of civilized countries, where not only specie, but paper money and an intricate credit machinery, are used in effecting payments. But the same principles hold good here, if adjusted. Instead of saying that the general range of prices depends (other things being equal) on the quantity of specie, we must say that it depends on the total quantity of money equivalents, or of the available *total purchasing power* in terms of money. In proportion as this total purchasing power becomes greater or less, prices will rise or fall — other things, such as the flow of commodities for sale into the market, being still assumed to be the same. A very troublesome problem is the relation between this total of

¹ See below, Chapter 23, § 1.

purchasing power on the one hand, and the total quantity on the other hand of gold or other freely coined specie. This problem cannot be solved until the whole range of substitutes for specie and the whole machinery of credit payments have been examined.¹ The conclusions of the present chapter must therefore be taken as provisional. Yet it may be said at once that in the long run they do hold good. For short periods, even for many years, it is often difficult to trace any connection between the quantity of specie and prices. Even in the long run it is never possible to trace that precise inverse relation to the value of money which has been deduced in the preceding pages. On the other hand, in the long run, a relation between the volume of specie and prices is in fact to be discerned; while the quantitative relation between prices and the total purchasing power in terms of money remains unshaken.

¹ See below, Chapter 30, where the theory of prices is restated with the qualifications amplified.

CHAPTER 19

THE COST OF SPECIE IN RELATION TO ITS VALUE

Section 1. The determination of the value of the precious metals by the marginal cost is impeded by (1) their durability; (2) their irregular and aleatory production; (3) the unexpected occurrence of new sources of supply, 249 — Sec. 2. Illustrations from history. The American specie of the sixteenth century, and the price revolution of 1550-1650, 252 — Sec. 3. The Australian and Californian gold discoveries of 1850, and their comparatively slight effect on prices, 255 — Sec. 4. The increase of gold supply since 1890, and its effect on prices, 257 — Sec. 5. For considerable periods, the value of gold determines what shall be the marginal source of supply; it is not the marginal source of supply which determines its value, 259.

§ 1. The value of money has been considered in the preceding chapter so far as demand and supply directly affect it. But the supply of specie, like that of any other article, is affected by its value. When value is high, the supply is likely to become greater; when it is low, supply is likely to become less. Specie comes from surface deposits and from mines — chiefly from mines. What are the conditions of supply?

In general, articles yielded by mines show the phenomena of varying costs and of diminishing returns. Some mines are better than others; any one mine, as more is extracted from it, tends to encounter sooner or later increasing costs. On grounds of general reasoning, we are then led to expect that the value of the precious metals will tend to conform to their cost of production at the poorest mine, or at the poorest part of the best mines. It will conform, we should expect, to the marginal cost of production.

In fact, however, no close correspondence, nor even a rough correspondence, can be made out between the cost of the precious metals and their value. This, at least, is the situation with regard to gold. For silver the correspondence is perhaps in very recent times closer, yet thru most of human history it has been

equally uncertain for silver and for gold. The main causes of this lack of conformity with the theoretical scheme are three — the durability of the precious metals, the aleatory character of mining, and the irregular discoveries of new sources of supply.

Of these three causes, the most important is the first. The durability of the precious metals brings it about that changes in current output affect the total stock very slowly. For most commodities the supplies produced five years ago are quite out of the market. This holds good even of durable articles like iron and copper. The iron mined five years ago may indeed be still in existence, but it has been fashioned into implements and is committed to uses which practically withdraw it from the market. So far as gold and silver are used in the arts, they also are, for the most part, withdrawn permanently from the market. But gold and silver used as money remain in the monetary market indefinitely. Even if cost of production is greatly reduced, and the annual output greatly enlarged, the monetary stock changes but gradually and value is affected but slowly.¹

Next, the very conditions of production at the mines have been irregular thru almost the whole course of history, and, tho perhaps less markedly, remain irregular to this day. The irregularity appears in mining not only for gold and silver, but

¹ The world's monetary stock of gold was estimated in 1907 at roughly \$7,200,000,-000. (Helfferrich, *Das Geld*, edition of 1909, p. 203.) The product in that year was \$440,000,000; deducting the gold used in the arts (130-150 millions), there remained for the year a net addition to the monetary stock of say \$300,000,000, or about four per cent. As compared with any previous period this was an extraordinary addition to the supply, absolutely and proportionally.

The following figures illustrate the difference in this regard between gold on the one hand and two other metals, iron and copper, on the other. In 1912, there were produced in the United States 1,200,000,000 pounds of copper, of which one-half was exported and one-half used in the country. In addition 200,000,000 pounds of old copper were remelted. That is, three-quarters of the amount put on the American market for the year came from the year's output. For iron (1909) the corresponding figures were 26,000,000 tons of new product and 5,000,000 of old (scrap); over five-sixths came from the year's output. The gold added from the mines to the world's monetary supply — not the total output, but the amount coined — at about the same time (1907) was 15,000,000 ounces. The total monetary stock was 350,000,000 ounces. The year's output thus was but four per cent of the gold doing duty as money. And the percentage of new product at this period was abnormally large — probably the largest recorded in history.

for all metals. It is difficult to estimate in advance what will come out of a hole in the ground. For those mineral products which occur in large masses, under conditions enabling systematic tests and samples, the element of uncertainty and risk, tho ever present, is at least greatly less. Such is the case with coal and iron ore. Copper mining seems to be much more speculative; gold and silver mining, even more so. With these the elements of uncertainty are great, and the obstacles in the way of an adjustment of value to marginal cost correspondingly great.

The aleatory character of the production of gold and silver has been accentuated by another circumstance. Mining for them has always had a peculiar fascination, and cool-headed calculation has been absent more than in other mining. In general, it might be expected that there would be successes enough to offset (with some rough approximation) the failures; prizes against the blanks in the lottery. But, as is so commonly the case with avowed lotteries, the blanks are overlooked, the prizes only are seen. A gold mine in everyday speech stands for riches. Statesmen, explorers, investors, have been deceived by the glamour of mining for specie. The profitableness of such mining depends, not on getting the specie, but on getting it, with sufficiently little labor and expense. A large output may be got at an expense so high as to wipe out all profit. Yet people have been constantly tempted to gold and silver mining without rational weighing of yield and cost. Most persons who have engaged in it have over-estimated the possible prizes. They have disregarded not only the blanks, but to a large extent the inevitable expenses.

In very modern times, gold and silver mining have come to be carried on more systematically, on a larger scale and with less risk. This change is due to the improvements in mining methods which make it possible to extract the metals from low-grade ores. In former times, the main sources of supply were very rich alluvial deposits and pockets of very rich ore. The occurrence of such lucky finds is irregular, and their continued productivity, even after they have been hit upon, is even more irregular. But there are other deposits, where the ore has a small content of fine metal

but is very large in amount and is easily tested and measured. By establishing a great plant, and treating vast bodies of ore, quantities and profits can be secured with hardly more irregularity than in mining iron ore. The same is true of alluvial mining when conducted not on chance deposits along the beds of streams, but on whole hillsides washed by powerful hydraulic machinery. Methods of this more businesslike sort have brought the great increase in the output of gold and silver which set in toward the close of the nineteenth century.

Third, and closely connected with what has just been said, is the influence of new sources of supply. This factor has played an important part in the production and prices of all the metals, especially in modern times; as for example in regard to iron and copper. It has always had special importance with the precious metals, because of that amalgamation of old and new supplies which results from their durability. When new and rich mines have been discovered, the output from them has not displaced existing stocks but has simply been added to them. It is so also with the output from the unsuccessful mines. The poor mines may have been unprofitable to those exploiting them, the gold and silver yielded have contributed permanently to the amount in use. Hence the monetary stock at any given time has been a jumble from rich mines and poor mines; ancient supplies from forgotten sources have mingled with new additions from well-known regions; there has been accidental discovery and scientific exploitation; the whole finally constituting one vast homogeneous mass and exerting its influence on value thru its total quantity.

§ 2. These general statements can be illustrated by considering the history of some of the great changes in the supply of the precious metals.

Among the most remarkable changes recorded in history is that which took place between the middle of the sixteenth and the middle of the seventeenth century. Then the production and supply of both gold and silver were revolutionized. For the sake of simplicity, gold has been chiefly spoken of in the preceding

pages. But until comparatively recent times silver was a more important monetary metal than gold. Gold and silver were used interchangeably at the period of the great revolution, and the supplies and the values of both may be treated for this period as if they were one.

During the Middle Ages and the Renaissance specie had been comparatively scarce. Some supplies had been left over from the days of the Roman Empire; and there was some production, especially of silver, in Germany, Sweden, Bohemia, Spain. The general range of prices was low. So far as can be made out from a comparison of the commodities dealt in then and now, prices in the fifteenth century were only one-fourth or one-fifth of what they were in the nineteenth. It must be remembered, too, that payment in kind was still largely prevalent; hence the supply of gold and silver which was on hand served to carry on exchanges for only a limited part of the commodities produced and used. The discovery of America led in the sixteenth century to a great increase in the supply. The conquest of Mexico in 1519-21 and that of Peru shortly afterward enabled the rapacious Spaniards to seize large accumulated treasures. Even more important was the production from the rich mines of these countries — mines partly known already to the natives, partly discovered by the Spaniards. By far the most important were the mines at Potosi, discovered in 1545. Silver was the main product, and it was in the form of silver that the monetary supply of Europe was chiefly increased. In the first decades of the sixteenth century the total production of silver had been on the average 1,500,000 ounces a year. It rose to near 3,000,000 ounces in the period from 1521 to 1544, and in the period beginning with 1545 (the year of the opening of Potosi) it leaped to 10,000,000 ounces a year. About the last figure it remained for two centuries thereafter.¹

This great mass of new specie was brought to Europe by the Spanish treasure fleets. A share was captured on the way by

¹ Figures for the annual production of the precious metals are given regularly in the reports of the United States Director of the Mint.

the English and Dutch buccaneers, but most of it reached Spain and thence made its way over Europe. Very large amounts never went into circulation in Spain, but were sent by the Spanish monarchs, especially Charles V, Philip II, and Philip IV, to meet the expenses of their armies in Italy, Germany, France, and the Netherlands. Thru one channel or the other, the silver and gold reached all Europe. In part, as was noted in the preceding chapter, it simply enabled exchange by money to supersede exchange by barter; it percolated, so to speak, into spaces not previously occupied. But even with this absorption, the increase in quantity was so great as to swell the amount of money relatively to the commodities exchanged, and so to bring about what is known as the price revolution of the sixteenth century.

The total supply in Europe has been estimated thus:¹ —

	GOLD (OUNCES)	SILVER (OUNCES)
In 1493	17,682,500	225,050,000
In 1544	26,202,250	295,458,500
In 1600	38,322,800	771,600,000
In 1660	48,225,000	1,005,330,500

Stated in terms of dollars, this means that the stock of gold and silver, taken together, rose from about \$580,000,000 in 1493 to \$1,620,000,000 in 1600 and to \$2,500,000,000 in 1660. By the middle of the seventeenth century, prices had risen to double or treble what they were at the opening of the sixteenth century. The change worked itself out chiefly during the hundred years from 1550 to 1650 — a century of far-reaching industrial transformation in many directions, and of social and political changes as important, all complicated and affected by the great rise in prices.

¹ I take these figures (converting kilograms into ounces) from Wiebe's *Geschichte der Preisrevolution im 16. und 17. Jahrhundert*, p. 281. They are at best very rough estimates. The figure for 1493 (the starting point) is most uncertain of all. Moreover, the estimates are for the total metallic stock, not for the monetary stock. My own impression is that the increase in monetary supply itself was greater than these figures indicate; but one can have merely an impression, no certain knowledge.

The marked advance in prices — the fall in the value of money — was due unquestionably to the increase in the quantity of specie. But it would be misleading to speak of it as determined or measured by a corresponding change in cost of production. The miserable laborer — more than half slave — in Peru and Mexico was forced to his work in the mines by the brutal Spaniard; tho great quantities of specie came from the rich mines, it would be absurd to speak of any commercial adjustment of value to cost.

By the middle of the seventeenth century something like a state of equilibrium had been reached. The supplies of specie from the mines, it is true, continued to be as large as they had been since 1545, and even increased somewhat during the eighteenth century. But the total stock on hand had been so swelled that the continuing additions were of much less proportionate effect. A fair degree of stability in value had come from the durability of the accumulated stock. There was moreover a steady advance of population and wealth, an improvement in the arts, and so an increase of the quantity of goods presented for sale. Hence during the second half of the seventeenth century and the greater part of the eighteenth the range of prices was tolerably stable, with rather a downward than upward trend. During the first half of the nineteenth century, the trend of prices was distinctly, tho not rapidly, downward. This downward movement was not due to any decreased supplies of specie; on the contrary, the production of silver increased considerably, and that of gold held its own. But the great expansion which had followed the industrial revolution of the eighteenth century was in full swing, and the quantity of transactions increased more rapidly than the monetary supplies.

§ 3. Another far-reaching change in the production of precious metals set in about 1850. It was gold that now was chiefly affected. Gold deposits of extraordinary richness were discovered almost simultaneously in California and Australia. The production rose from an annual average of something like 500,000 ounces in 1820-40 to an annual average of over 6,000,000 ounces in 1851-60; and this rate of production was main-

tained, with no marked changes, for nearly half a century. Stated in terms of dollars, the annual gold supply rose from, roughly, \$10,000,000 in 1820-40 to about \$125,000,000 in 1850-95. During the twenty-five years from 1850 to 1875 as much gold was produced and added to the world's stock as had been produced during the three and a half centuries from 1492 to 1850. If the dividing line be put at 1840 (for there was already a marked increase from 1840 to 1850), it appears that the gold product between 1840 and 1875 markedly exceeded that between 1492 and 1840. The change in the monetary stock was of course much greater. Of the amount which had been produced between 1492 and 1850, a large proportion had been lost by absorption in the arts, by abrasion, and by exportation to the eastern hemisphere (a loss so far as European countries were concerned). The total monetary stock of gold in Europe was in 1850 about 38,000,000 ounces, or, in terms of dollars, about \$780,000,000. So sharp was the increase in production that, by 1860, the total monetary stock (after allowing for industrial consumption during the decade) was reckoned at 88,000,000 ounces, or about \$1,800,000,000. In ten years the monetary supply of gold had doubled.¹

The effect on prices after 1850, however, was not comparable to that of the earlier period. Prices did indeed rise after 1850 in Europe and the United States, and remained at a comparatively high level for about a quarter of a century. But the advance was one of only twenty or thirty per cent. No such revolution in prices took place as that which followed the discovery of America.

The explanation of this slight effect from a cause apparently so powerful is to be found in several directions. There was a steady increase in the demand for money. The civilized world was progressing fast, and the volume of commodities produced and exchanged was enlarging. Next—and probably this was more important in the decades immediately after 1850—the new supplies of gold were added to an existing stock composed, not of gold only, but of both gold and silver, and of the two metals

¹ I take these figures from Soetbeer's *Materials on the Silver Question*, 1887 (English translation, p. 150).

coined and used with equal freedom. In that stock silver had been the major constituent in 1850. Finally, the new supplies of gold in part served simply to displace silver. Of this process of substitution more will be said when the topic of bimetallism is reached.¹ It suffices here to note that in France and other bimetallic countries, much gold simply took the place of silver, the silver being lost to civilized countries by steady exportation to the Orient. So far as such substitution went on, the new supplies of gold served to alter the composition of the metallic money of Europe, but not to add to its total volume. There was indeed a net addition to the total volume, and an addition more than in proportion to the greater volume of commodities. Hence a rise in prices took place; only to that moderate extent, however, which has been indicated.

§ 4. We pass over for the present the period of falling prices in the last quarter of the nineteenth century, since that period can be best considered in connection with bimetallism. In the production of gold, another great change set in during the closing years of the nineteenth century and the opening years of the twentieth. The annual output of gold had remained nearly stationary after the Californian and Australian discoveries of 1850. During the decade 1880-90, there had been some slight tendency to decline, but no marked change. Thereafter production rose rapidly; it doubled before the close of the nineteenth century; it quadrupled within five years thereafter. In 1880-90 the annual production had been on the average something like \$100,000,000. In the year 1900 it was over \$250,000,000; in 1910, \$455,000,000. The change was almost miraculous. The total production of gold was greater during the twenty years 1891-1910, than it was during the forty years 1850-90; and during each of these periods it was much greater than it had been during the centuries that elapsed between 1493 and 1850.²

¹ In the following chapter.

² The production of gold may be grouped as follows:—

Aggregate during the 357 years, 1493-1850	· · · · ·	152,000,000 ounces
Aggregate during the 40 years, 1850-1890	· · · · ·	232,900,000 ounces
Aggregate during the 20 years, 1891-1910	· · · · ·	284,000,000 ounces

This vast addition to the stock of gold was the foundation of the rise in prices which took place in the Western nations, and indeed the world over, during the first decade of the century (1900-10). What other causes were at work, and to what extent the simple quantity theory must be modified in accounting for the higher prices, need not here be considered. The increase in the gold supply was the dominant cause. One circumstance which operated as a drag on the upward movement of prices in 1850-75 was not present, namely, the displacement of silver. Gold had won its victory. Silver had been displaced once for all, or at least reduced to a subsidiary place. The additions to the gold supply were in the main *net* additions to the monetary stock of Western countries, and additions of extraordinary amount. No doubt, the great and steady growth in the volume of commodities brought an increasing demand to meet the increasing supplies of gold; whether the demand grew in proportion must be doubted.

The new supplies of gold were derived, as already remarked, chiefly from low-grade ores; that is, from great deposits of ore having a very low content of gold, but capable of being worked systematically on a great scale. It is profitable to mine ore which yields only \$10 (half an ounce) to the ton; that is, ore which contains gold in the proportion 1:75,000.¹ The most notable source of this kind is in South Africa, where the mines of the Transvaal tempted fortune hunters and led to the subjection of the sturdy Boers. The so-called reef there is of great extent and calculable richness. For a considerable time the Transvaal mines alone produced annually nearly as much as the world's annual output in the richest period of the Californian and Australian discoveries. Similar deposits are worked, by the same improved methods, in the United States, and indeed in all parts of the world. American mining engineers and managers have been foremost in this march of improvement. As a result, the efficiency of labor in producing specie has been increased as much as in producing coal or iron or most manufactured commodities.

¹ There are even mines, worked with handsome profit, in which the ore contains only \$2.50 gold to the ton, or 1 part in 300,000.

Any uniform increase in the gold supply, even tho great, tends to have a progressively smaller effect on prices. Each increment enlarges permanently the existing stock; and the succeeding increments, tho equally great, are less in proportion to the stock as enlarged. The increase or supply takes place by arithmetical progression; it would have to take place by geometrical progression in order to continue to lift prices at the same rate as at the start. The monetary supply of gold doubled between 1850 and 1860. But after 1860, the stock on hand had been so much enlarged, that tho the same annual output was maintained, the rate of enlargement in the total supply was much relaxed. When a stream of water floods a valley, the first inflow raises the level very fast. As the inflow continues, there is a widening of the area over which the water spreads, and the same addition to the supply produces a steadily lessening effect in raising the surface. So it is with an increase in the supply of the money metals.

§ 5. At the beginning of this chapter it was said that we should expect gold to be governed in value by the principles that apply under varying costs and diminishing returns. That is, we should expect value to be determined, in the long run, by cost at the poorest source of supply, or at the marginal mine. In fact, however, over periods as long as it is commonly worth our while to consider, the relation is more nearly the opposite. It is not so true that cost at the marginal mines governs value, as it is that current value determines what sort of mine shall remain in operation and shall become the marginal mine.

This inverted relation is due to the operation of two of the factors noted in the first section: the durability and consequent large accumulated stock of gold, and the irregularity in the discovery of new supplies. The great stock on hand determines or at least underlies the value of the specie. Those mines that are workable at this value continue to yield their supplies. Those that are not workable at this value cease. (We disregard here the aleatory character of gold mining, which causes some production even at a loss.) The richer mines, which yield a large profit at current values, in any case continue to yield supplies; very probably

the major part of the annual output comes from them. Value does not accommodate itself to cost at their hands, because of the slow influence of the annual yield on the total stock. A decline in the value of gold — that is, a general rise in prices — makes things harder for the poorer mines, and some of them cease operations. But cessation on their part may have but a negligible effect on the total stock. Search for new mines is constantly going on. All new ventures add something to the annual yield, even tho many of them are unprofitable and therefore only of temporary effect. Some of the ventures are highly successful, and on occasions — as in California and Australia in 1850, and in the Transvaal since 1890 — contribute huge supplies suddenly. It might be expected that a high value of gold (that is, low prices) would stimulate the search for it, a low value (high prices) dampen the search. Some such tendencies there doubtless are. They are overshadowed, however, in their effects on total stock and on value, by the steadiness of the total stock and the irregularities of discovery and exploitation. Historically, therefore, it is very difficult to discover any but the loosest connection between the cost of gold and its value. Over long periods — for generations at a time — the value of the metal determines which among the mines are able to hold their own. It is not these mines that determine the metal's value.

This proposition, at all events, seems now to hold good of gold. Until very recent times it held good of silver also. During the great silver flood which followed the discovery of America, the mines in Germany and other parts of Europe had to accommodate themselves to the new range of prices and the new value of silver. Those which were no longer profitable under these new conditions ceased operations; and the silver production of Europe shrank sensibly during that period. Within the last thirty or forty years, however, silver has been put into a very different position. It has become in the main an industrial metal, like tin, copper, nickel; and its value is determined now by causes essentially the same as those acting on these other metals. This great change in the position of silver is the main subject of the following two chapters.

CHAPTER 20

BIMETALLISM

Section 1. Both metals long used side by side. The fully developed double standard illustrated, 261 — Sec. 2. Mint ratio and market ratio; overvalued and undervalued metal. Tendency of the overvalued metal to displace the undervalued, illustrated by the experience of the United States, 262 — Sec. 3. "Gresham's Law," 265 — Sec. 4. Subsidiary coinage and its proper regulation, 267.

§ 1. In the preceding pages no attempt was made to consider the relations between gold and silver. The supply of specie was treated as if gold and silver constituted a homogeneous mass throughout most of monetary history, however, difficulties have arisen in the endeavor to treat the two metals as homogeneous. These difficulties became accentuated in the nineteenth century and finally resulted, at the close of that century, in the displacement of silver from the position of a freely coined money metal. This change, one of the most notable in monetary history, was brought about in a surprisingly short space of time. For long centuries silver had been freely coined, and had been the more important monetary metal; it was discarded in the brief course of one generation.

Both before and after the great inflow of specie from the Spanish-American mines, the two metals were used interchangeably. Silver was relatively the more plentiful, and the more commonly used. It was possible to coin each metal independently, and let the two sorts of pieces circulate together, but not on any common basis. Yet it was highly convenient to link them together in some way, so arranging their denominations that they could be used interchangeably. Gradually the double standard system developed: both metals were manufactured into coins of the same or similar names and denominations. The method is illustrated in the system of the United States. The silver dollar contains

371 $\frac{1}{4}$ grains of pure silver, or 412 $\frac{1}{2}$ grains of silver $\frac{1}{10}$ fine. (The gold dollar contains (or rather, if coined, would contain) 23.22 grains of pure gold, or 25.8 grains of gold $\frac{1}{10}$ fine. Their weights are to each other as 16 to 1. (15.988 is the precise figure, commonly spoken of as 16.) This is the coinage ratio; the silver dollar contains sixteen times as much pure metal as the gold dollar. Similarly, in France, the five-franc piece of silver contains 347.22 grains of pure silver, and the corresponding piece of gold would contain 22.4 grains of pure gold. The French coinage ratio therefore is 15 $\frac{1}{2}$ to 1.

Under the pure double standard in its complete form both metals are freely coined. Any holder of silver bullion can bring it to the mint, and have it manufactured into coin without limit of quantity, and the holder of gold bullion has the same right. Moreover, all coins, whether silver or gold, are made full legal tender for the payment of debts; that is, of debts contracted, as most debts are, simply in terms of so many dollars or francs. These two elements — free coinage and full legal tender — are the essentials of the complete double standard.

§ 2. When the double standard is adopted, the question arises whether the ratio at which the metals are coined by the mint and are thus given purchasing power in the form of money, conforms to their values as bullion. If at the mint 16 ounces of silver are coined into as many dollars as 1 ounce of gold; and if, as bullion, 15 or 15 $\frac{1}{2}$ ounces of silver can be sold in the market at a price equivalent to 1 ounce of gold — no one will bring silver to the mint. The silver will be more valuable as bullion than as coin; and experience proves that a very small fraction of difference suffices to decide that the metal shall not be presented for coinage. If, on the other hand, silver as bullion can be sold only at the rate of 16 $\frac{1}{2}$ or 17 ounces of silver for 1 ounce of gold, no one will bring gold to the mint. The holder of an ounce of gold can get for it at the mint only as many coined dollars as he can get for 16 ounces of silver. (By exchanging his gold in the market for 16 $\frac{1}{2}$ or 17 ounces of silver bullion, he can get more coined dollars; and accordingly he will present silver bullion only at the mint.) To re-

peat, a very small variation between the ratio fixed at the mint and that which rules in the open market will cause one or the other of the two metals to be the sole one presented at the mint for coinage.

The metal which tends under such conditions to be presented at the mint is said to be overvalued. The metal which is not presented, and which indeed may be subjected to the opposite process of being melted into bullion from coin, is said to be undervalued. Strictly speaking, the mint regulations do not put valuation on either metal; they simply state the conditions of coinage. But the regulations, when they are those of the complete double standard, do lay down in an effective way a relative value. Where silver is coined at a ratio of 16 to 1 of gold, the coinage system says that 16 ounces of silver are required to buy as much as 1 ounce of gold; the market says that 15 ounces suffice. Silver is given a higher value in the market, a lower value by the mint; by the mint it is undervalued. And where silver is worth 17 ounces in the market, it is overvalued at the mint if coined at this same ratio of 16 to 1. The mint then says that 16 ounces of silver are required to buy as much as 1 ounce of gold, but in the market 17 ounces are needed to buy as much.

That metal which is overvalued will tend to become the sole constituent of the metallic circulating medium. It alone will be presented at the mint for coinage. This, to be sure, will tend to withdraw it from the bullion market; and this process will tend to raise its value as bullion. Conversely the undervalued metal, not being presented at the mint for coinage, will tend to be more plentiful in the market as bullion; and this will tend to lower in turn its value. The offer of free coinage under the double standard thus in some measure exercises a steady influence on the relative value of gold and silver; a fact which, as will presently appear, has been of no small importance in monetary history. But if there be a permanent force at work which brings about a continuing difference, even tho' a slight one, between the market valuation and the mint valuation, then the undervalued metal will gradually go out of circulation, the overvalued metal

will come more and more into circulation, and eventually the metallic money will consist of the overvalued alone. If there is a considerable and sustained variation between mint and market valuations, this process will work itself out very quickly; the cheaper or overvalued metal will displace the other in a very short time.

No country's history presents a simpler illustration of these principles than that of the United States. When our coinage system was established in 1792, the complete double standard was adopted, at the ratio of 15 to 1. That ratio was chosen after careful inquiry; but it proved to differ from the market ratio, which was about $15\frac{1}{2}$ to 1. The ratio of $15\frac{1}{2}$ to 1 was accepted about ten years later for the coinage system of France. Silver accordingly was overvalued at the United States mint, and gold was undervalued. No gold was presented for coinage, and the metallic circulating medium consisted wholly of silver.¹ In 1834,

¹ Silver dollars of United States mintage were, in fact, little used in this earlier period. The coins were chiefly of foreign mintage, largely Mexican dollars, which passed current at rates specified by law for their receipt in payment of public dues. The foreign coins took the place of the United States coins because they were abraded or light weight. (Note what is said in § 3 about Gresham's Law.)

The changes in the coinage system of the United States are shown in the following table. The coinage ratio, it must be remembered, rests on the relative weight of pure metal in the coins.

UNITED STATES COINAGE

YEAR	GOLD DOLLAR			SILVER DOLLAR			RATIO
	Standard Gold (gross weight of coin)	Fineness	Pure Gold	Standard Silver (gross weight of coin)	Fineness	Pure Silver	
1792	grains 27.00	916.66 / 1000	grains 24.75	grains 416	892.4 / 1000	grains 371 $\frac{1}{2}$	15 to 1
1834	25.8	899.225 / 1000	23.2	416	"	371 $\frac{1}{2}$	16.002 to 1
1837	25.8	900 / 1000	23.22	412 $\frac{1}{2}$	900 / 1000	371	15.988 to 1

The pure content of the silver dollar has remained the same throughout — 371 $\frac{1}{2}$ grains of fine silver. The change in ratio was accomplished in 1834 by lessening the amount of pure metal in the gold dollar. In 1837 further minor changes were made, bearing chiefly on the proportions of alloy in the coins. These proportions had previously been irregular. The fineness was now made $\frac{1}{10}$ for both gold and silver, and at the same time a slight addition was made to the pure content of the gold dollar, making a trifling change in the coinage ratio.

in consequence of various causes — partly a reaction against undue use of paper money, partly a spasmodic desire to use gold because of the discovery of what were supposed to be large deposits in North Carolina — the ratio was abruptly changed. It was made 16 to 1. It overvalued gold as much as the old ratio had overvalued silver and gold alone was now presented at the mint for coinage. Silver gradually drifted out of circulation and out of the country. The change was virtually from a silver standard to a gold standard. After the California gold discoveries in 1850, the change became pronounced. Great quantities of gold were coined at the mint, and silver quite disappeared. Arrangements were indeed made (in 1853) for the use of silver, as subsidiary coin, and in later years its coinage into legal tender dollars was resumed; but these later modes of using silver presented new questions, of which more will be said shortly.

§ 3. The tendency of the overvalued metal to drive out the undervalued is often termed Gresham's Law. The name is derived from a Sir Thomas Gresham of the sixteenth century, who gets undeserved fame, as if he had been the discoverer of the tendency. The "law" is simply the commonplace fact, long recognized, that (where coins of different bullion value circulate side by side, the cheaper, if there be enough of them, will displace the better.) The cheaper money metal will be used by preference in presentation at the mint and in making payments; the dearer will be used by preference in the arts or for bullion purposes.

An important illustration of this tendency is in the displacement of full-weight coins by light-weight or abraded coins of the same metal. Until the nineteenth century the machinery for manufacturing coins worked slowly and somewhat imperfectly. It was difficult to turn out a great many coins rapidly; and the coins minted not only were subject to ordinary abrasion, but, in consequence of uneven mintage, were specially subject to clipping. New and good coins were therefore likely to be picked out for use in the arts or for exportation, while only the poorer pieces remained in circulation. Such seems to have been the common situation of silver coins until far into the nineteenth century.

Silver coin, because of its more frequent use, is more subject to abrasion than gold. Moreover, it is more likely to pass current and to remain in circulation, even tho abraded; since it is used in minor transactions, a trifling deficiency in bullion content, even a considerable deficiency, is likely to be disregarded. People commonly accept the smaller pieces as they are offered in payment, without troubling themselves to inspect them. In the United States — to give an example — during the period from 1792 to 1834, when silver was the money metal in circulation, foreign silver pieces of various mintage were in actual use. These foreign coins had been authorized for use in public payments, because at the beginning no United States mint or coins existed. When the mint was established and coins were issued from it, the new coins could not displace the foreign pieces, being full-weight and preferably used for the arts or exportation. Hence the coinage seemed futile and was discontinued, only the more or less imperfect foreign coins remaining in circulation. Difficulties of a similar sort were long encountered in all European countries, from the Middle Ages thru the eighteenth century. The remedies for them are simple: first, the plentiful and accurate manufacture of full-weight coin; second, the withdrawal of all legal sanction (such as receipt in payment of public dues) from other coin; and third, the redemption at the public charges of pieces which become worn by ordinary wear. It was formerly common to enact that pieces which had suffered in weight beyond a certain tolerance should not only lose their validity as legal tender, but should be redeemed at the mint merely as bullion, not at their face value. The holder, thus called on to suffer the loss in value from abrasion, tried to pass them on to another person. Since the payment of ready money is usually welcome to the payee, even coins much abraded remained indefinitely in circulation. It is now the common practise, and the sound one for governments, to redeem at their face value all coins which have not been intentionally clipped or sweated.¹ At the same time, the machinery for providing new

¹ The United States, however, redeems gold coins at their face value only where the depreciation is not more than one-half of one per cent.

and good coins is amply adequate. The particular troubles here described have well-nigh disappeared.

§ 4. The difficulties commonly experienced under the double standard have caused resort to another mode of using both metals together. Gold is made the only freely coined metal and the only one having complete legal tender quality, and silver, tho still coined, is not coined freely, but in limited amounts and solely for use as a minor coin. This method was first systematically followed by England when she adopted the single gold standard in 1816. It has since been adopted, so far as subsidiary silver is concerned, by all the civilized countries, and has become a normal accompaniment of the gold standard system.

The system of the United States may serve as example. The high value of gold makes it unavailable in minor payments. The smallest gold piece which can be conveniently used is the quarter eagle (\$2.50), corresponding to the British half sovereign, the German ten-mark piece, the French ten-franc piece. Even the quarter eagle and the corresponding coins of foreign countries are of doubtful serviceability; they are easily lost or overlooked, and are subject to comparatively rapid abrasion. A piece of the sovereign or half eagle size (\$5) is the smallest gold coin that is thoroly satisfactory. Yet a multitude of transactions must be settled with money of smaller denominations. Silver coins are convenient, in sizes from the ten-cent piece to the dollar piece. For the smallest transactions even silver has not bulk enough; for these, resort must be had to nickel and copper.

Under the complete double standard it may well happen that, if silver is undervalued, all the silver coin, large and small, will disappear and that an inconvenient scarcity of small change will ensue. This is precisely what happened in the United States under the system which was adopted in 1834 and 1837. Silver was then undervalued and gold gradually took its place. When finally the California gold poured in abundantly after 1850 and gold coinage at the mint assumed large dimensions, silver completely disappeared from circulation. Hence in 1853 an act was passed which created the subsidiary system in this country. Silver coins

were authorized — half dollars, quarters, and dimes — containing so light a content of fine silver that no one would be tempted to export them or to melt them for the arts. The silver half dollar, for instance, was made to contain (and still contains) 172.8 grains of fine silver, or 345.6 grains for two half dollars. The silver dollar, whose free coinage at that time was still authorized, contained (and still contains) $371\frac{1}{4}$ grains. If all silver coins had been freely minted at the rate newly adopted for the half dollars and for the other subsidiary coins (345.6 grains to the dollar), silver would then have been overvalued, and in turn would have displaced gold. But something very different from free coinage was put into operation. No private person was entitled to present silver at the mint for conversion into small coin. The government itself bought the silver bullion in the market, and alone arranged for its coinage. The amount which the government thus bought and coined was limited to the quantity supposed necessary to meet the needs of small-change transactions. Thus the silver coin would not be exported, and yet would not displace gold. To guard against possible abuse, it was further provided that the subsidiary coin should be legal tender only up to a limited sum, now fixed at \$10.

Obviously, the government makes a profit by an operation of this sort. The overvalued silver coins are paid out by the government in its ordinary disbursements, or are exchanged by it for full-value gold. In either case there is a profit. This also is often called a "seigniorage," tho it differs in important respects from the seigniorage which may be charged on the freely coined and full-value pieces.

Such are the essential principles of subsidiary coinage. Substantially the same system had long been followed as regards the copper and nickel coins adapted for petty transactions. These have been token coins ever since gold and silver came to be used as the standard metals. In fact, the underlying principle — an artificial value due to limitation of quantity — was followed, or attempted to be followed, in the "billon" coins common in Europe from the Middle Ages until the first part of the nineteenth

century. These were pieces in denominations for small transactions, having some percentage of silver, but chiefly alloy, issued by kings and princes primarily for profit and given a circulation within their territories. The issues were often excessive; the opportunity for profit was abused. In this respect, as in so many others, coinage practise during the nineteenth century was greatly improved, and now is well-nigh perfected. No state now coins subsidiary pieces, whether silver or nickel or copper, with a view primarily to profit. The profit accrues because it is incident to the best method of providing a convenient medium for small transactions.

The regulation of subsidiary coin is carried on with variations of detail in different countries. The quantity coined is sometimes fixed at so much per head of population. Thus in Germany subsidiary silver was minted in 1910 at the rate of 15 marks (formerly 10 marks) per head of population; in France at the rate of 7 francs (formerly 6 francs) per head. In Great Britain no specific limit is set; the Bank of England arranges for the coinage of such amounts as experience from time to time shows to be needed. In the United States, also, no limit is set.

To prevent any possible depreciation of the subsidiary coin, it is usually redeemable at its face value by the government treasuries when presented in reasonable amounts. In the United States, for example, subsidiary silver coins are redeemable when presented in sums of \$20, in Germany when presented in sums of 200 marks. The same object is accomplished by receiving them without limit of quantity in payment of public dues, as is the case in France.

CHAPTER 21

BIMETALLISM, *continued.* THE DISPLACEMENT OF SILVER

Section 1. The double standard in France, and elsewhere, until recent times.

Its tendency to keep the relative value of gold and silver stable. This effect produced by French bimetallism, 1825-73, 270 — Sec. 2. New situation after 1870. Free coinage of silver ceased in 1873. Thereafter, gold the standard in France and the Latin Union, 273 — Sec. 3. The United States; acts of 1873, 1878, 1890, and 1893. Silver dollars and silver certificates, 276 — Sec. 4. Cessation of free coinage in British India in 1893. Decline in the price of silver, 278 — Sec. 5. Would universal bimetallism conduce to a stable ratio between gold and silver? 281 — Sec. 6. Would universal bimetallism conduce to stable prices? 283.

§ 1. We turn now to a consideration of the relation between silver and gold during the nineteenth century and to the train of events which ended in the virtual discarding of silver and the general adoption of the single gold standard.

The double standard, traditional in Europe for many centuries, was chosen by the United States in 1792 as the normal system. It was maintained by France when in 1803 she established her present system of decimal coins. In England, it is true, the single gold standard, with silver for subsidiary coins only, was adopted in 1816. England had had, thru the eighteenth century, a normal double standard, with a circulation composed in fact chiefly of gold. In 1816 the gold standard was formally and definitively established. But on the continent of Europe in general the double standard prevailed, with a stock of metallic money made up, as a rule, chiefly of silver. France alone had a circulation in which gold, tho by no means the largest constituent, yet was important side by side with silver. That great country emerged from the wars of the Napoleonic period in a prosperous state; and her continued prosperity and her large stock of both metals had an important influence on monetary history for over half a century.

It has already been said that the very existence of the double standard tends to bring the relative values of gold and silver

toward the ratio chosen. When a supply of the overvalued metal is attracted to the mint, so much less of it is left in the open market. Its value tends to rise, it becomes less overvalued, perhaps ceases to be overvalued at all. When, on the other hand, a supply of the undervalued metal is melted or exported, so much more of it comes on the market. The additional supply tends to lower its value, and the market ratio comes nearer to the mint ratio. A country having a double standard may be said to be in the position of one who offers to buy and sell at its coinage ratio (say $15\frac{1}{2}$ to 1) any quantity of gold and silver that may be offered. This is not literally the case; the country does not directly buy gold and silver bullion. But its free coinage of both is tantamount to purchase, so long as a supply of both metals remains in circulation, and the substitution of one for the other can actually take place. When once either metal has completely displaced the other, this consequence no longer appears.

Some effect of this sort was produced by France during the second quarter of the nineteenth century; and a marked effect was produced in the third quarter.¹ Whenever the price of silver fell in terms of gold, silver tended to be sent to France for coinage, and gold tended to flow out of France. Whenever the price of silver rose in terms of gold, gold tended to be sent to France for coinage, and silver tended to flow out. A high price of silver in terms of gold means, of course, a low market ratio, while a low price of silver means a high ratio.² During the greater part

¹ The first quarter of the nineteenth century was much disturbed; moreover, our information as to the flow of specie into and out of France is exact only after 1822. Hence the narrative in the text is confined to the second and third quarters.

² The relation of the ratio to the usually quoted price of silver may be stated thus:—

AT THE RATIO OF	THE PRICE OF FINE SILVER IN UNITED STATES MONEY IS	THE PRICE OF BAR SILVER (.925 FINE) IN BRITISH MONEY IS
16 : 1	\$1.2919 per ounce	53.93d. per ounce
15½ : 1	1.3336 per ounce	60.83 per ounce
15 : 1	1.3780 per ounce	62.86 per ounce

of the period from 1820 to 1850, the price of silver was somewhat lower than the equivalent of the French ratio of $15\frac{1}{2}$ to 1. Silver tended to flow into France; gold tended to flow out. The French circulation then consisted chiefly of silver; the proportion of gold was not large, and a very great substitution would have led to the complete disappearance of gold. That stage was nearly reached, but not quite. France was growing in population and wealth, and there was the basis for a large net increase in the stock of specie. Much of the added silver made its way into circulation without displacing gold, and the outflow of the latter metal, tho it seems to have come very near to exhausting the stock in circulation, did not entirely do so.

After 1850 the situation abruptly changed. The unexampled supplies of new gold from California and Australia were poured into the world's markets. The price of silver rose; the ratio fell. It became advantageous to send gold, not silver, for coinage into France. A very great influx of gold took place, amounting for the decade 1850-60 to over 3,000,000,000 francs (\$600,000,000). A corresponding, tho by no means an equal, outflow of silver took place. For in this period, as in that preceding, France increased her metallic stock, with the difference that now the addition was all in the form of gold, whereas before it had been chiefly in the form of silver. The silver which was steadily exported from France tended to keep down the price of silver bullion in the market, and so maintained the market ratio not far from $15\frac{1}{2}$ to 1, tho now with a tendency to a figure lower than $15\frac{1}{2}$ rather than higher.

The bimetallic régime in France during the period immediately following 1850 thus served to steady both the general range of prices and the ratio between gold and silver. A great part of the new gold simply displaced silver in France. The superseded metal, again, made its way very largely to the East; and, as it happened, the movement of specie to the East¹ was in this period unusually large. There the silver was absorbed without sensibly affecting prices even in those regions. The free opening for coin-

ing both metals in France has been justly described as operating like a parachute to arrest the fall of the value of gold. Some fall — that is, some rise in prices — did indeed take place; but it was less sharp than would have been the case without the French coinage influence.

This episode has been cited by the advocates of bimetallism, and justly, as an illustration of the benefits that may come from their system. Some critics have maintained that the result failed of attainment, so far as concerns the relative value of gold and silver, because the market ratio was not perfectly steady. It fluctuated, tending to be a trifle above $15\frac{1}{2}$ to 1 before 1850, a trifle below after 1850. But no one would maintain that an unfailing steadiness at the price exactly equivalent to a ratio of $15\frac{1}{2}$ to 1 was either possible or in any significant degree desirable. It suffices if a reasonable approach to steadiness is secured. Some fluctuations, according to the changing currents in international trade and in the foreign exchanges, are inevitable; so much will become clear when at a later stage the subject of the foreign exchanges is taken up. In essentials, the bimetallists can point to the French experience, certainly during the period after 1850, as counting in favor of their system.

§ 2. Later in the nineteenth century another change set in, not quite so abrupt as that after 1850, but no less unexpected. The production of gold had reached its maximum about 1860, and thereafter barely held its own. The inflowing new supplies were still very great as compared with any period before 1850; but they spread over a larger area, and they were met by an increasing volume of goods. The industries of the civilized world were rapidly expanding, and the demand for money on the whole kept pace with the supply. On the other hand, a change began in the production of silver. Great discoveries were made in the United States, the beginnings of an increase in the productiveness of silver mining as striking as that which had taken place in gold mining. The price of silver in the market fell slightly about 1865. Silver no longer flowed out of France, and some silver flowed in. The market price for a few years was equiva-

lent almost exactly to the ratio of $15\frac{1}{2}$ to 1. Then in 1873 it fell more sharply, became equivalent to a ratio of 16 to 1, and led to a new inversion of the movement; gold began to flow out of France in large quantities, and silver began to flow in.

This inversion proved unwelcome. Gold had come to be regarded, reasonably or unreasonably, as the preferable metal. The practise of England, the leading industrial country, was the main cause of this preference. The German Empire, when re-organizing its currency system in 1871, adopted the gold standard once for all, influenced chiefly by the English example. The coinage of the United States had been, after 1850, practically on a gold basis. France, not wishing to lose her gold, in 1873 stopped the free coinage of silver. In this measure France no longer acted alone. With other countries she had formed in 1865 the Latin Union; the other countries being Belgium, Switzerland, Italy, and Greece.¹ The main object of the Union was the adoption of a uniform decimal coinage system, based on the French franc. Complete bimetallism, with free coinage of both metals at $15\frac{1}{2}$ to 1, was also adopted; and thereafter all these countries had to act in common in their mint and coinage legislation. France was by all odds the most important power in the Union, industrially as well as politically. With the checkered and interesting history of the Union we have not space to deal; it served a useful end by promoting the spread of the rational decimal system, but it led to much friction and inconvenience between the adherent countries. The decisive steps were taken in 1873-74; then free coinage ceased, tho not all of silver coinage. In 1873 France, acting alone at first, limited the amount of five-franc pieces (that is, of full-tender silver) which would be coined at the mint. Belgium, also acting alone, imposed a similar limitation in 1873. In 1874, the Latin Union, by a special agreement, prescribed the same policy for its members, the amount of five-franc pieces

¹ Greece joined the Latin Union in 1868. Spain adopted the franc system, but did not join the Union. Greece and Italy, the members, have counted for less than the other countries, because their currency, during practically all of the time when action regarding silver coinage was under consideration, was on a paper basis. As to paper money, see Chapter 23, below.

to be coined being apportioned among them. Limitation was soon followed by complete cessation. In 1878 the coinage of five-franc pieces was stopped; and it has never been resumed. Bimetallism came to an end.

The cessation of silver coinage left the metallic circulation of these countries in a situation not different on the surface from that of bimetallism, yet in essentials very different. Gold and silver coins continued to circulate side by side, and maintained the relative values assigned to them at the mint. The silver five-franc pieces were not subsidiary coins; they were legal tender without limit in payment of debts. Yet in important respects they were like subsidiary coin. They were no longer freely minted; and their intrinsic or bullion value was different from that which they had as coin. The price of silver bullion continued to fall. If free coinage of silver had been retained in France and the Latin Union, silver would have been presented at their mints in larger quantities. But it was no longer accepted; gold alone was freely coined. The silver coins were as good as the gold, for payments within each country, and indeed thruout the Union, since they were of uniform shape and content. They were (and are) legal tender without limit and they were received without limit in payments to the government for taxes and other dues. Large quantities of gold, on the other hand, were also in circulation. This gold had to be in use, in addition to the silver. If the monetary supply had been confined to the silver alone, its limited quantity would have caused prices to be low; this again would have caused imports to be small, exports to be large; money would have flowed in; and the only kind of money which now could flow in was gold.¹ The silver five-franc pieces, like subsidiary coin, were given an artificial value by the limitation of their quantity; and their value conformed to that of freely coined gold.

To this situation in France and the Latin Union, never established by design, but reached thru a succession of tentative steps,

¹ The reasoning here anticipates what will be said later of the working of international trade. But this part of the theory of international trade is so simple that its bearing will be readily seen. Compare, Chapter 32.

the name "limping standard" has been applied. The silver coin, tho intrinsically of less value than the gold, hobbles along, maintained at equality by being coupled with its stronger associate. The same situation has developed in other countries also, partly by deliberate action, partly by steps taken with as little intent of bringing about a limping standard as in the Latin Union.

§ 3. In the United States a result exactly similar to that in France was brought about, without intent, thru a succession of compromises and half measures. The history of this episode cannot be fully understood until price movements and paper money have been dealt with. So far as the silver situation is concerned, it will suffice to state briefly the important events.

In 1873 the coinage of silver dollars — that is, of the full tender, freely coined silver — was dropped in the United States. It was in this year, too, that France suspended free coinage; but the coincidence in date was fortuitous. The United States in 1873 had only paper money in circulation — depreciated paper, or so-called fiat money. If there had been specie in circulation (and for some important purposes specie was in use, tho not in active circulation) that specie would have been gold. After the coinage changes of 1834 and 1837, and the influx of new gold that began in 1850, gold alone had been the real basis of the monetary system. The existence of a nominal double standard had been forgotten. In 1873 the coinage legislation of the country was overhauled and consolidated, in the expectation, realized in 1879, that paper money would be given up soon and a specie system reestablished. In this revision of the statutes, the silver dollar was dropped from the list of coins that could be struck. Therewith bimetallism, long obsolete in practise, was formally ended by law. The change naturally attracted little attention. In later years, when a strong agitation for renewed use of silver had sprung up, the dropping of the silver dollar was often called "the crime of 1873." It was supposed to have been stealthily done by persons interested in securing the gold standard. In fact, it was done quietly because nobody at the time thought it of any moment.

After 1873 a period of depression and of falling prices set in. A strong party in the United States wished to check the fall, and welcomed any legislation which would add to the quantity of money in use.¹ For a generation, there was agitation for a return to complete bimetallism — to the free coinage of both gold and silver. At the old ratio of 16 to 1, and at the market prices of silver after 1873, this would have meant the actual coinage of silver alone. Yet this radical step, tho often it seemed impending, was never taken. By way of compromise two great measures were passed, each providing for a large tho limited quantity of overvalued silver dollars.

In 1878 the so-called Bland-Allison Act was passed, requiring the monthly purchase by the government of not less than \$2,000,000 worth of silver bullion nor more than \$4,000,000 worth; this bullion to be coined into dollars of the old content (412½ grains of standard silver, 371¼ grains of pure silver). The minimum only under the act was in fact bought and coined — \$2,000,000 worth of silver. The number of dollars obviously was more than two million a month. If the price of silver, in terms of the money which the government used in buying it (this money was gold after 1879) happened to be low, more silver bullion could be bought with the fixed sum of \$2,000,000 and a larger number of dollars coined; if the price was high, less bullion could be bought and less dollars coined. In fact, during the period from 1878 to 1890, when this act was in force, the outcome was an average monthly coinage of about 2,500,000 silver dollars, or 30,000,000 a year. These dollars were precisely like the French five-franc pieces; overvalued, limited in quantity, full legal tender, and in every respect as valid for payments as gold.

In 1890 a second measure was enacted, again a compromise between free silver coinage and rejection of silver. Without entering on the details of this complicated and luckless statute,

¹ A political party is not meant here; neither Democrats nor Republicans were consistent in their policy as regards silver coinage. The silver party was made up of adherents from both political parties.

it may be said, in sum, that during the three years of its life (it was repealed in 1893) silver was purchased by the government which added eventually not less than 218,000,000 silver dollars to the country's money supply. Under the act of 1878, there had been coined, in round numbers, 352,000,000 such dollars. When these operations finally came to an end, a total of 570,000,000 dollars of overvalued silver had been injected into the circulating medium.

It is not so much in the form of coin as in that of the silver certificate that the silver has made its way into actual circulation. This kind of paper money, as the name indicates, is merely a certificate or warrant stating that so many silver dollars (one, two, five, as the case may be) are held in the government vaults and will be paid to the bearer on demand. Since the paper representatives are for most people more convenient than the somewhat bulky dollars, their issue has greatly facilitated the actual circulation of the additional money.

Evidently the possibility of adding these hundreds of millions to the monetary supply of the United States, and yet keeping them equal in value to gold, rested on the fact that this is a huge country; and not only a huge country, but one whose industry advances at a prodigious rate. An indefinite increase in the quantity of overvalued or "fiduciary" money would mean the eventual expulsion of gold. Between 1890 and 1893, the rate of increase under the act of 1890 was so great that gold seemed about to be expelled; and this probability was one cause of the remarkable crisis of 1893, and of the repeal of the act. In later years, the population, resources, and industrial output of the United States advanced by leaps and bounds. The quantity of commodities offered in exchange for money rose enormously. Hence gold not only remained in the country side by side with the silver, but the quantity in monetary use increased. Consequently the overvalued silver had its stronger companion side by side, and was held up to an equal value; it was as good as gold.¹

§ 4. One other important event remains to be noted, the

¹ In the course of the Great War, a large part of the silver dollars held by the United States Treasury against outstanding certificates was sold as bullion to the

last in the chain of those which deposed silver from its former monetary place. In 1893, the same year in which the United States ceased its purchases of silver for coinage into dollars, British India put an end to the free coinage of silver. The flow of specie to the East, already referred to,¹ had always been chiefly in the form of silver. British India, by far the most important country of the East, had coined that silver freely into rupees (the bullion content of the rupee is about two-fifths that of the United States dollar). The continued fall in the price of silver caused serious embarrassments.² After long and patient waiting, the British government in India finally took the drastic step of closing its mints to silver. Thus in one year, 1893, the last two great markets for silver — United States and British India — were closed. This was just twenty years after the French mint began the great change.

The bottom seemed to drop out of silver in 1893. Its production had been steadily increasing for a quarter of a century. Before 1870 the annual supply from the mines had been about 30,000,000 ounces. After 1870, it rose thus:—

	MILLION OUNCES
Average annual product in the 5-year period 1871-1875	63
" " " " " 1876-1880	79
" " " " " 1881-1885	92
" " " " " 1886-1890	109
" " " " " 1891-1895	158
" " " " " 1896-1900	165
" " " " " 1901-1905	168

So great a fresh supply pressing on the market, with most mints closed to free coinage, caused a steady decline in price. In terms of United States money, the ounce of silver fell from \$1.29 in

British government, which used the silver to meet a pressing need for rupees in British India. A corresponding amount of silver certificates was at the same time withdrawn, and replaced by special issues of federal reserve bank notes of similar small denominations. This was a temporary and makeshift proceeding. After the war steps were taken to replace the silver by purchase, to recoin the dollars, to issue silver certificates once more, and to withdraw the specially authorized bank notes.

¹ Chapter 18, § 4.

² See Chapter 23, § 5; Chapter 32, § 6.

1873 to about \$.90 in 1892. The American purchases under the acts of 1878 and 1890 did not serve to prevent that decline, tho doubtless they made it less abrupt. With the two closures of 1893 (in the United States and British India), the price fell sharply to \$.67. In 1894 it was on the average about \$.64.

From 1893 to the period of the Great War silver maintained, on the whole, the levels reached in that year both as to production and price. The production did not diminish, and indeed rose sensibly after 1906; the price remained in the neighborhood of \$.60 an ounce. At that price the market ratio is about 34 to 1. It follows that the silver dollar contained less than half its nominal content; that is, as metal it was worth less than fifty cents in gold. The French five-franc pieces were overvalued to a similar degree. Silver became in all the leading countries a commodity like any other, fluctuating in price according to market conditions. It was bought in large quantities by governments for manufacture into subsidiary coin, and the demand for this purpose has proved to increase steadily. It was used in the arts in growing quantities; and the East still absorbs considerable amounts, partly for monetary use, partly for ornament, partly for hoarding. That its production continued undiminished, notwithstanding the great fall in price, indicated that its marginal cost was not greater than the price that ruled during this period.

It will now be obvious why, as was stated in the preceding chapter, the value of silver is related to its expenses of production in a different way from what it was in former centuries, and in a different way from gold. Silver no longer has a free opening in monetary use. The annual supply can no longer be added, as can that of gold, to a vast monetary stock. What part shall be added to the circulating medium in the form of subsidiary coin depends on the purchases which governments choose to make. The output of the mines is sold, like that of other metals, at whatever price it will fetch. The price corresponds in a rough way to its marginal cost, and is in a rough way determined by its marginal cost. The existing silver coins of the countries of the limping standard are kept at an artificial value;

but this artificial value has no influence on the value of the newly accruing supply.

§ 5. Two entirely different questions of principle arose during the course of the deposition of silver. One concerned the relative values of gold and silver, and the effects on those relative values of bimetallism and of monometallism. The other concerned the general range of prices and the effects on prices of bimetallism and monometallism. The bimetallists contended that their system conduced to a more stable ratio between silver and gold. They also contended that it conduced to a greater stability in prices. On the first question they were probably in the right; on the second question the verdict of history was on the whole against them.

We have seen, in the case of France, that the very existence of complete bimetallism — free coinage of both metals — tends to keep the value of the two metals in correspondence with the ratio. Suppose now that the industrial area over which free coinage prevailed had been very much larger than France. Suppose that not only France and the Latin Union, but England, Germany, the United States, had coined silver and gold freely at the French ratio of $15\frac{1}{2}$ to 1. From this vast area the expulsion of gold would have been difficult, nay, well-nigh impossible. The countries mentioned include all in which gold was freely coined during the period of the great fall in silver. Whither could the gold have been driven? The ordinary avenue of departure — exportation — could hardly have been followed, since there were no important countries to which large quantities of gold could have been exported. A rapid rise in general prices would perhaps have stimulated industrial consumption; but this would have been a slow process, coming to its end long before all the gold had been absorbed in the arts. A rapid rise in general prices, again, might conceivably have checked the production of gold; but this too would have been a slow and uncertain process, having its term like the other — at the point where the poorer mines had been brought to a stop. The monetary stock of gold would have remained in monetary use without great change, and would

perforce have remained in circulation side by side with silver. This result would have been the more probable because, if the leading countries had adopted bimetallism at a common ratio, the lesser countries would have been likely to join them. International bimetallism, applied unflinchingly by the leading countries, would have brought about the proximate object — the concurrent circulation of the two metals as money, and a market value corresponding to the mint ratio.

This conclusion is subject to possible qualification. It rests on the assumption that people in general, and the business community in particular, would accede to the regulations contemplated (and in part prescribed) by governments. Thus, silver would be made a legal tender in payment of debts, and therefore as good as gold for a vitally important monetary use.¹ Conceivably, however, general opinion — general prejudice, if one is disposed so to call it — would boycott the use of silver. As will be seen in connection with the history of paper money,¹ the power of government in forcing the use of a particular kind of money has its limits. To confer on money the legal tender quality is by no means necessarily to make it pass in general circulation. But in the special case here supposed for silver it is not probable that a government would have overpassed the limits within which it can influence the use of money. Silver was in most parts of the world, in the period from 1873 to 1893, a familiar and not unwelcome form of money. True, in Great Britain it was not familiar, and much prejudice in that country, and in the United States and Germany also, would have had to be overcome; yet the obstacles against the acceptance of the new situation would hardly have been insuperable.

An experiment of this kind would have been most interesting to the economist; but the political obstacles to international bimetallism made it impossible. There never was a chance for the conclusion of a compact. Great Britain at no time was willing to accede, except as to British India, which would not have brought any new strength to the bimetallic league. Without

¹ See below in this Book, Chapter 23, § 1.

Great Britain, Germany would not come in; without at least one of those countries, the United States would not. Whatever the abstract possibilities of united bimetallism, the project never had a working prospect of realization.

§ 6. Very different is the second question that arose regarding the stability, not of the ratio between the metals, but of the general range of prices. And this, obviously, is by far the more important question. It does not matter much to the community (tho it may very greatly concern the mine owners) whether silver exchanges for gold at the rate of 15 to 1 or 30 to 1. But it matters very much whether prices go up or go down or remain stable. That they should remain as stable as possible is the desirable situation. How far would international bimetallism have promoted this result?

The answer to this question depends on the extent to which the total supply of specie — gold and silver — would have been affected. In the year 1890 the answer seemed doubtful. The production of gold then seemed virtually stationary. That of silver, on the other hand, was rapidly mounting, in face of a steady fall in price. The opponents of bimetallism maintained that silver, once restored to free coinage, would be produced in immensely greater quantity. Under modern mining methods vast known deposits of low-grade silver-bearing ore can be treated; the question is not merely one of discovery or speculative exploitation, but largely one of calculable profit. Raise the price of silver to \$1.33 an ounce (the price in United States gold corresponding to a ratio of $15\frac{1}{2}$ to 1), and floods of silver might be expected to come out. Opponents predicted that the addition to the monetary stock would be so huge as to double all prices in ten years. The bimetallists on the other hand said that the increase in output would not be great, and that, with a stationary or declining output of gold and with a great area over which the total metallic stock could spread, the change in prices would be slow, and so far as it did take place rather beneficial than otherwise.

Whatever doubt there may have been regarding the probabili-

ties of the case — and there was much, about 1890 — was set at rest by the new conditions which set in after that date. The wonderful increase in the annual product of gold has already been described. The danger of a scant supply of gold — so scant as to keep prices moving downward — disappeared. If silver had been freely coinable as well as gold, the total supply of the two metals would have increased at a portentous rate. Even at the low prices of silver which have prevailed after 1893, the production of that metal did not diminish. At doubled prices, it would surely have increased fast, and so have added much more to the supply of specie. Bimetallism would have led not to stable prices, but to prices even less stable than under the single gold standard, and advancing even more rapidly. The extraordinary increase in the production of gold put an end for an indefinite period to all proposals for rehabilitating silver.

CHAPTER 22

CHANGES IN PRICES

Section 1. Changes in prices measured by index numbers. The simple arithmetical mean. Illustration from prices in the United States, 1913-18, 285 — Sec. 2. Weighted index numbers. Medians. Illustration from prices in the United States, 1890-1906, 288 — Sec. 3. Effects of changes in prices on creditors and debtors, 293 — Sec. 4. Peculiar problem where the movement of prices is different from that of money incomes, 294 — Sec. 5. Rising prices seem to cause prosperity, falling prices adversity. This is due to the slower advance of money wages, and the consequent gains or losses of employers of labor, 297 — Sec. 6. Changes in prices are accompanied by changes in the rate of interest. The parallel movement due, not to any conscious adjustment, but in part to the effects on business profits, in part to the general causes of oscillations in prices, 301.

§ 1. Two topics will be taken up in the present chapter: first, how to ascertain and measure whether changes in prices have taken place; second, what are the consequences for good or ill of such changes. Of the causes of the changes nothing more will be said for the present.

The measurement of changes in the value of money would be easy if all prices went up and down together. But this they never do. Some prices go up, while others go down. Occasionally, in times of very great and rapid movement, almost all prices change in the same direction. Even then, some rise or fall in less degree than others. In 1916-18 the general trend of prices in the United States was unmistakably upward; most commodities advanced sharply in price, some enormously. Yet a few showed a downward movement. The extreme range was from oil of lemon, whose price in 1918 was only one-third of what it had been a few years before, to a drug, acetiphenetidin, whose price became fifty times as high as before.¹ The fact of a change in a given

¹ I take these illustrations, and also those on page 287, from the *History of Prices during the War*, prepared by Professor W. C. Mitchell and published in 1919 by the War Industries Board, Washington.

direction be clear, the complexity of the phenomena makes difficult the measurement of its extent.

To get a summary expression of the general trend of prices, resort is had to the method of index numbers. An example will best explain how an index number is constructed. Suppose that on January 1, 1900, the price of iron was \$15 a ton, of wheat \$1 a bushel, of cotton 10 cents a pound, of wool 40 cents a pound. These are called the base prices. Later prices are expressed in relation to them, usually by stating them in terms of a percentage. Suppose that a year later, on January 1, 1901, the prices of these four commodities have come to be \$20 for iron, \$1.25 for wheat, 10 cents for cotton, 36 cents for wool. Then the actual prices, and the percentage relation between them, would stand thus:—

	1900		1901	
	BASE PRICE	100	PRICE	PERCENTAGE TO BASE
Iron	\$15.00	100	\$20.00	133
Wheat	1.00	100	1.25	125
Cotton10	100	.10	100
Wool40	100	.36	.90
Total		400		448
Average(arithmetical mean)		100		112

The index number was 400 for 1900, and rose to 448 for 1901.

Reduced to the arithmetic mean, the index number for 1900 was 100; that for 1901 became 112. Sometimes index numbers are given in the first form, by simple summation; such, for example, is the mode in which the well-known index number of the *London Economist* is made up. More often the numbers are averaged. The base average, of course, is always 100; the average for any other year is then a percentage of the base average. In the example just given, the index number shows a rise in prices of twelve per cent; or, rather, as the very word "index" implies, indicates a rise to that extent.

If, now, instead of four commodities, fifty or a hundred were treated in this way, we should feel some confidence in the indica-

tion obtained as to a general change in prices. If the summarized result for a large number of articles is an advance of ten or twenty per cent in the index number, it is tolerably certain that most commodities have gone up in price. No doubt the result may be due to the fact that half the commodities went up a great deal, while the other half went down, tho but moderately. But an examination of actual changes, even a cursory one, almost always shows, where a marked change has occurred in an index number, that the large majority of prices have moved in the one way indicated. The index number serves, therefore, to point to a fact --- that on the whole prices have moved in one direction.

To illustrate: during the years immediately preceding the war of 1914-18 and during the war period itself, the index numbers for prices at wholesale in the United States, calculated on this plan, were as follows:

July 1, 1913 to June 30, 1914 (base)	100
Calendar year 1913	101
" " 1914	99
" " 1915	102
" " 1916	126
" " 1917	175
" " 1918	194

A sharp advance in prices is here indicated. It is true, as has been mentioned, that a few commodities actually fell in price; yet they were no more than two per cent of the whole number of articles. With these almost negligible exceptions, all commodities sold at higher prices in 1918 than in 1913-15. Yet, unmistakable as was the general trend, nothing like a uniform movement took place. Grouping the several articles according to the extent of the advances, we find that in 1918

9 per cent of the articles showed prices between 130 and 149
15 " " " " " " " " 150 and 169
15 " " " " " " " " 170 and 189
11.5 " " " " " " " " 190 and 209
9.5 " " " " " " " " 210 and 229
7.0 " " " " " " " " 230 and 249
67.0 " " " " " " " " 130 and 249
10.3 " " " " " " " " of less than 130
22.8 " " " " " " " " of 250 or more

In other words, two-thirds of the articles were sold at prices ranging from thirty per cent higher to one hundred fifty per cent higher. The change, tho it showed great variety and irregularity, was almost universal; the index number, which registered an advance of ninety-four per cent, or almost a doubling of prices, summarized an upward movement which was great and rapid, and yet was highly complex.

§ 2. Other modes of reaching index numbers have been proposed, the arithmetical mean being criticized as crude and inadequate. Some of the suggested improvements may be briefly noted, and the usefulness of the simpler method tested by comparison with the results from those more complex.

The geometrical mean has been advocated; and sometimes other mathematical means. Of the geometric mean it is said, with undoubted truth, that its use will mitigate a misleading effect on the index number from extraordinary fluctuations in the price of a single article. With the use of logarithms the geometric mean is easy to ascertain; and it has quite as good a right to be entitled a "true" average as the arithmetic.

Another proposal is for the use of the median. Let the index numbers be made up, not by averaging, but by ascertaining midway points. Arrange the several price quotations for any year (reduced to a uniform basis as for the other methods) in numerical order, and then ascertain that figure which stands in the middle of the series — that figure on either side of which there is an equal number of quotations. For various sorts of observations the median is thought by statisticians to be at least as significant as any average; and tho comparatively unfamiliar, it is easy to use. Even more than the geometric mean, it prevents an extremely high or low price of some one article, or of a very few articles, from having an undue influence on the index number.¹

¹ Thus if a series of price quotations, reduced to a basis of 100, were

86	102
90	106
94	110
97	120
100	

Entirely different is the improvement of the simpler method itself — the arithmetic mean — by taking account of the relative importance of the different articles; or, as it is technically put, by *weighting* the articles. A change in the price of wheat, for example, is of much more importance than a change in the price of wool. If wheat were to double in price, the purchasing power of a given income would be seriously affected; if wool were to double in price, much less. The varying importance of different commodities may be regarded in the construction of an index number by assigning weight to the commodities in the proportion of their consumption. If the community as a whole spends four times as much of its income on wheat as on wool, wheat may be counted as if it were four articles and wool as if it were one. If twice as much is spent on cotton as on wool, cotton may be counted as if it were two articles; while iron, on similar assumptions, may be counted as three. The prices used in the original illustration would then be made up into an index number as follows: —

	1900			1901		
	WEIGHT	BASE PRICE	WEIGHTED BASE	PRICE	PERCENTAGE TO BASE	WEIGHTED CHANGE IN PRICE
Wheat . . .	4	\$1.00	400	\$1.25	125	500
Cotton . . .	2	.10	200	.10	100	200
Wool . . .	1	.40	100	.36	90	90
Iron . . .	3	<u>15.00</u>	<u>300</u>	20.00	<u>133½</u>	<u>400</u>
Total . . .	10		1000			1190
Average . . .			100			119

This weighted average indicates a rise in prices from 100 to 119, whereas the simple average indicated one from 100 to 112 only. And the weighted average is plainly the more significant; since the median would be 100. If the last figure were not 120, but 150, the median would still be 100.

There being in this series an odd number of figures, the median is the middle one. If there were an even number, the median would lie between the two middle figures, and would be in so far indefinite. But where there are many figures, as is always the case with price quotations, the median is sufficiently precise.

For an illustration of divergence between the median and the arithmetic mean. see Chapter 23, p. 312.

the higher prices of widely used articles like wheat and iron are more important than the lower price of the less used wool.

Tho the weighted index number is clearly preferable, the application of this more refined method presents difficulties. It is not easy to ascertain the consumption or relative weight of the several articles, especially where a very large number (100 or more perhaps) are included in the list. Moreover, the consumption of the different articles varies. Changes in habits take place; one article may be much less used in 1910 than in 1900; how readjust the weight given it and the whole weighted index number? These difficulties, and others that might be instanced, tho not insuperable, add to the complications of weighting.

In regard to all these suggestions, whether for improvement in the arithmetic mean or for the use of a different mean, it must be borne in mind that no index number corresponds to a real thing. It is not like the mean of certain observations in natural science — such, for example, as those for measuring the distance between the earth and the sun — of which any one may err, but whose average will point to a single specific fact. An index number points to no single fact. It gives, to repeat, only an indication of the general trend of prices. People often speak and think loosely on this topic, as if an index number told the whole story once for all. There is no one change in prices. There is a medley of many changes, different in direction and degree. All that we can hope to secure by averaging and summarizing is some concise statement of the general drift.

Now experience in the application of the various methods to the same sets of figures shows that the simple arithmetic mean, when applied to a sufficiently large number of price quotations, gives substantially the same results as more refined methods. If many articles are in the list, some of much importance, some of little, it is unlikely that all the important articles will fluctuate in one direction and all the unimportant in another. If they did so (as in the example just given), weighting would be indispensable. But the fluctuations in fact are likely to be distributed among the several classes in much the same way. An unusual change

in the price of a particular article, whether it be consumed in large amounts or in small, will not affect greatly an average made up from many price quotations. And in practise it has been found that the simple unweighted average brings results not very different from those obtained after weighting. Similarly it has been found that the method of the median does not yield, for such fluctuations in prices as take place under a specie standard,¹ results substantially different from those of either the simpler or the weighted arithmetical mean.

This similarity of outcome is illustrated by the following chart, showing the course of four index numbers reached in different ways, all based on the same quotations of prices.² One repre-

¹ Compare what is said below, Chapter 23, p. 312.

² The four series are:—

(1) The Department of Labor's arithmetic means, for prices of 250 articles.

(2) Professor W. C. Mitchell's rearrangement of the same price figures: "The Bureau's list of commodities contains anomalies such as the inclusion of a single series [of quotations] for wheat and ten for cotton sheetings; two for hogs and three for glassware, etc. The result is most unscientific weighting in what purports to be an unweighted index number. To remedy this obvious defect, I have combined the series for nearly identical articles, thereby reducing the number of series to 145." — *Journal of Political Economy*, May, 1910, p. 372; compare the same writer's *Gold, Prices, and Wages under the Greenback Standard*, p. 19.

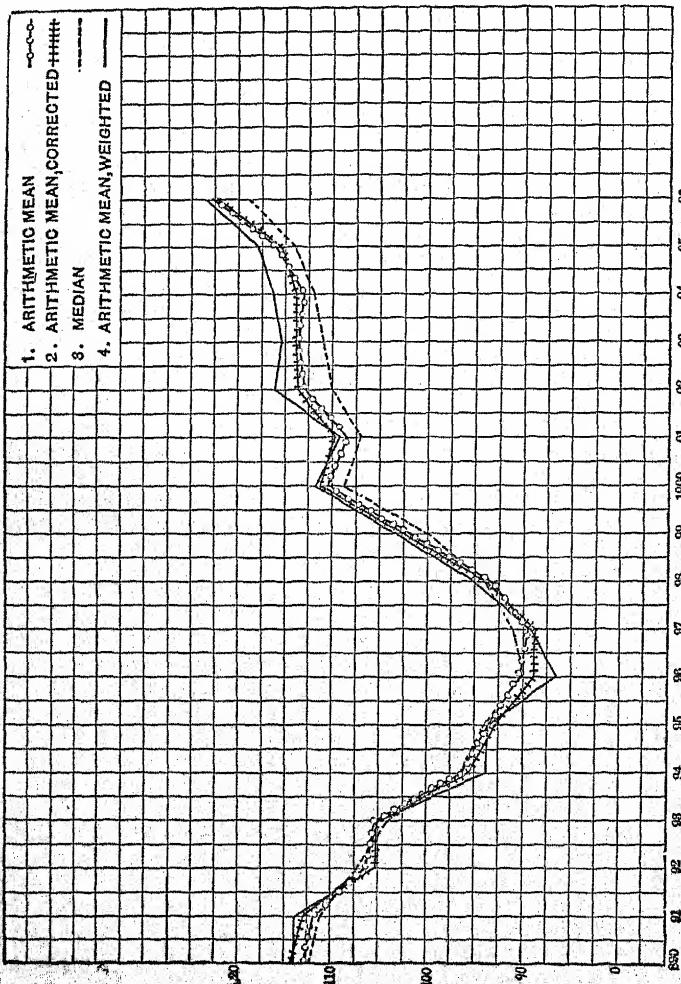
(3) The median for the same (145) series of quotations, as calculated by Professor Mitchell.

(4) A weighted index number for 50 staple articles, selected from among the 250 (145); the weighting being on the plan of the Gibson index, but revised by Professor Mitchell.

The figures of the four series are:—

	I ARITHMETIC MEAN OF 250 QUOTA- TIONS	II ARITHMETIC MEAN OF 145 QUOTA- TIONS	III MEDIAN OF 145 QUOTATIONS	IV WEIGHTED INDEX NUMBERS FROM 50 QUOTATIONS
1890	112.9	114.1	112	114.0
1891	111.7	112.7	111	113.9
1892	106.1	106.1	107	105.1
1893	105.6	105.0	104	105.2
1894	96.1	95.6	96	93.9
1895	93.6	92.8	94	93.9
1896	90.4	88.8	90	86.6
1897	89.7	88.7	91	89.2
1898	93.4	93.5	94	95.0
1899	101.7	102.5	100	103.4
1900	110.5	111.3	109	111.6
1901	108.5	109.6	107	109.2
1902	112.9	113.7	110	116.2
1903	113.6	113.8	111	115.3
1904	113.0	113.9	112	116.3
1905	115.9	115.8	114	117.9
1906	122.5	122.3	119	123.4

sents the simple arithmetic mean of 250 price quotations; the second, another arithmetic mean of the same prices consolidated into 145 quotations; the third, the median of these same 145 quotations; the fourth, a weighted index number of 50 among these commodities. The prices are at wholesale, in the United States, for the period 1890-1906; the "base," indicated by 100, is in each case the average (arithmetic mean) for the decade 1890-99.



§ 3. A rise in prices is of advantage to debtors; a fall in prices is of advantage to creditors. When prices go up in the interval between the contracting and the paying of a debt, the debtor, on returning to his creditor the amount of money borrowed, returns less in the way of commodities. Conversely, when prices go down in the interval, the debtor, on returning the same money, returns more in the way of commodities.

Most changes in prices are slow; from year to year there is little variation. Most debts, on the other hand, are for short periods of time. Hence fluctuations in general prices do not ordinarily cause injustice or serious embarrassment. Even over a period of several years the dealings between debtor and creditor are usually carried on with sufficient equity. An index number change of five per cent in a single year is unusual. Commonly our observations must extend over two or three years if we are to make sure that any general rise or fall is really in progress. A change of five per cent or ten per cent, as registered in an index number, would probably be little noticed by most debtors and creditors. Each would be concerned only with the particular articles bought or sold by him; and these articles might remain unchanged in price, or move in a different direction from the index numbers, or in different degree. It is only abrupt and marked changes in prices that disturb the usual approximate equity of debt payments. Under a specie standard, such changes take place rarely; this much is brought about by the durability of specie and the consequent slowness of changes in the total stock. Violent changes over short periods of time are usually caused by resort to irredeemable paper money. There is a sound basis for the attitude which most people take, of regarding specie as stable in value and of measuring incomes, possessions, debts and credits, once for all in terms of money.

The case is different with debts having a long time to run. As regards these, even under a specie régime, there is a considerable possibility of injustice and hardship. In the course of twenty years, possibly in the course of ten, marked changes in general prices may occur, and with them marked injustice to debtors or to

creditors, as the case may be. Tho obligations running over such a long period are not often contracted by individuals, they are not uncommon on the part of corporations and of governments. European governments, to be sure, when they borrow, usually do not undertake to repay the principal sum at any given date; they promise only the regular payment of a stipulated rate of interest. They reserve the option of repaying the principal (either at times expressly stated or at their discretion), but they need not repay unless it suits them. In such case they have a protection against loss from price changes, tho their creditors have none. The United States government has often borrowed on long time, and exposed itself to possible loss; a practise, however, which has been kept within such moderate limits as not to forebode substantial difficulties. Many of our great corporations, however, and especially the railway corporations, have borrowed quite without regard to possible price changes, and indeed also with complete disregard of possible changes in the rate of interest. Bonds have been issued payable after the lapse of forty, fifty, even one hundred, years, without provision for redemption in the interval. Who can say what will be the range of prices after the lapse of a century?

Such long-time obligations find a market because most investors (like other people) think of the value of money as unchanging, and because they are glad to have an income, supposed to be fixed, guaranteed for a long time. Corporations, on the other hand, when they wish to raise great sums of money, adopt the devices which will entice the investor. Yet in such engagements both debtors and creditors take great and unpredictable risks. Under monetary systems as they now are, and are likely long to remain, these risks can be avoided only by restricting all loans to periods of a moderate number of years.

§ 4. A different question of justice between debtor and creditor arises from the fact that money wages and other money incomes do not necessarily move in the same way as the prices of commodities. In the preceding sections, it has been tacitly assumed that these two movements — of prices and of money incomes

— are parallel. But one may lag behind the other; or the movements may be in opposite directions.

Suppose, for example — to take the sort of case which fortunately is most probable — that industry is progressing, the arts are advancing, the prosperity of the community growing. This means that real incomes are becoming larger; that the commodities and utilities at the command of the community as a whole, and on the average for each person, are more abundant. The concrete way in which that abundance must show itself, where all transactions and all exchanges are carried on thru money, is in cheapness of goods relatively to incomes. Goods may become cheaper, money incomes remaining the same; or money incomes may become greater, prices remaining the same; or some intermediate relation may appear. In any case, prices and incomes will not move together. Relatively to prices, money incomes will rise.

Thus, during the period of falling prices after 1873, money income on the whole did not fall. The evidence to prove this relates chiefly to the familiar crafts and to unskilled or little skilled labor; since comparison of wages at different times is here easiest. Money wages on the whole did not fall after 1873; they rather tended to rise. So it was as to those rates of wages which are euphemistically called salaries — the pay of teachers, corporation employees, public officials. The same upward tendency, or at the least stationary tendency, showed itself in the more irregular money incomes of professional and business men. With rising or stationary wages and incomes, and with falling prices, real incomes in terms of commodities and of utilities must have gone up substantially. Obviously, this was the natural outcome of industrial progress and cheapened production. That same outcome of progress and cheapness, however, must be expected to appear in a period of rising prices; only in this case in a different way. If prices advance, money incomes must advance at least as much, if real income is to remain the same. If the same fundamental forces are at work to promote progress and relative cheapness, wages and all money incomes must advance even

more than prices. If the increasing gold supply proves in fact to bring about continuously rising prices, we must expect that this change will be accompanied by an even greater rise in money incomes.¹

What, under such circumstances, are the relations between debtors and creditors? With prices falling and incomes stationary, debtors, paying their debts with the same amount of money, repay to creditors more in the way of commodities. This may be called repayment according to a labor standard. It is true that the debtor pays back more commodities than he got; but those commodities represent the same money income and (presumably) the same amount of labor as before. It may be fairly argued that the debtor suffers no injustice, if at the time of repayment he has the same money income as when he contracted the debt. The creditor simply shares in the greater cheapness of commodities due to improved production. Suppose, on the other hand, that there are stationary prices and rising incomes. The debtor, paying back the same money, pays back also the same commodities. It may again be fairly argued that the creditor suffers no injustice. He gets back precisely what he lent, in terms both of money and of goods. He can be said to suffer hardship only in that he fails to share the full advantage of progress. He does not experience, as others do, rising receipts with stationary expenses. The results in the two cases are different; yet in each it may be plausibly argued that the outcome is just, or at least not unjust.

It is fortunate that this intricate question of justice does not present itself in such a way as to involve the likelihood of any serious departure from the familiar and accepted principles of equity in debt payments. As a rule, movements in general prices proceed slowly, and therefore do not entail serious injustice as re-

¹ Long-run effects are here had in mind, and especially those long-run effects which are to be expected from steady gains in the efficiency of industry. The proximate effect of increasing gold supply, as pointed out in the next section, is to cause prices to rise faster than the wages of hired laborers (but not faster than all money incomes). It is only in the long run that this effect may be counteracted by that of continued improvement in the arts.

gards most debts; hence the relative changes of prices, money, and money incomes proceed slowly. Thus the inverse movement of wages and prices between 1873 and 1896, referred to a moment ago, could be observed only after careful observation of five-year and ten-year periods. Again, if rising prices are accompanied by money incomes rising still more, this change also comes, slowly and gradually, as the ultimate result of the irregular march of improvements in production.

If it be asked, none the less, which of these two situations — stationary incomes with falling prices, or rising incomes with stationary prices — brings the more equitable adjustment of the relations between debtor and creditor, the answer cannot be given with ready assurance. The problem involves a consideration of the whole problem of the right distribution of wealth, and more particularly the question whether equal return for equal labor is the right basis for dealings between man and man.¹ In this case, as in most others, we must be content if the outcome is satisfactory on the whole; if clear injustice is avoided, even tho that which is ideally just be not attained.

§ 5. It might seem that, barring the effects on debtors and creditors, rising or falling prices and wages are not of consequence. It is certainly of no consequence whether a community reaches finally a stage of high rates or of low rates. The only difference in the end is whether many counters or few shall be used in exchanges. But the process of reaching the end may bring results of its own. It is maintained by many that the transition to higher prices brings good results, the transition to lower prices bad results.

Periods of rising prices are, in fact, commonly periods of prosperity. In part, to be sure, that prosperity is rather apparent than real. People so habitually reckon their incomes and resources in terms of money that they think themselves better off when money incomes go up. They disregard, for a time at least, the fact that their expenses go up also. But it is not merely a matter of deceptive appearances. The business class feels a stimulus from rising prices; and so long as the management

¹ See Chapter 66, § 3.

of industry is in the hands of the business class, that which stimulates its members to activity commonly acts as a real stimulus to productive industry. In part, no doubt, the effect on business men, as on others, is psychological. They think they are gaining when prices rise, whether in fact they do or do not gain as regards the purchasing power of their incomes; and this appearance of gains spurs them to activity. But they secure also real and substantial advantages.

These advantages do not arise chiefly from the fact that business men are debtors. They are both debtors and creditors. It is true that in relation to the investors they are debtors. But the men of large affairs — the wholesale merchants, the manufacturers, the bankers — are creditors quite as much as debtors, in relation to the rest of the community; and it is the large-scale men who give the tone and temper to the business class.

The chief explanation of the optimism and activity which business men in general show in times of rising prices is found in the relation which they as a class hold to the laborers as a class. At bottom their main operation is to hire laborers; and they hire laborers to advantage at such times, because the prices of commodities go up faster than money wages.

That wages go up more slowly than prices is one of the best-attested facts in economic history. It holds good of almost all sorts of hired persons — not only manual laborers, but clerks, overseers, teachers, salaried officials. It is due mainly to the force of custom, which is especially strong as to wages; and it is strengthened often by the lack of bargaining power among laborers. It is connected with many peculiarities in the dealings between employers and employees, and especially with the position of the employer as feeling the brunt of any industrial change. Of the fact there can be no question; when prices rise, the wages of hired workers do not rise as fast.

As has been already said, and will be more fully explained at a later stage,¹ the operations of capitalists as a class, and of busi-

¹ Of all these matters, more is said in the chapters on Business Profits and Wages, in Chapters 49, 50, 52. Cp. also Chapter 5, § 5.

ness men as the managers of investment, are resolvable into a succession of advances to laborers. Their total expenses consist in the last analysis in a series of wages payments. To the extent that prices of commodities advance faster than expenses for the labor they buy, the payers of wages gain.

It is familiar experience that those business men gain most in periods of rising prices whose operations involve in largest degree the payment of wages. The mere trader or merchant usually gains least; the prices of the things he buys go up almost as fast as the prices of the things he sells. The manufacturer who buys few materials, and whose expenses are chiefly in the direct purchase of labor, profits most of all. Such for example is the situation of a highly integrated enterprise like the United States Steel Corporation, which hires laborers directly¹ to dig iron ore, mine coal, convert the coal into coke, transport these materials, smelt and shape the iron and steel. When the prices of the iron and steel go up, it gains hugely, since its main outlay, for wages payments, is nearly stable. Those iron and steel makers, however, who have to buy iron ore, or coal and coke, gain comparatively little; the prices of their materials go up as fast or nearly as fast as the prices of their products. The business man who is nearest the ground, so to speak—nearest the laborer—profits most from the relative stability of wages.

Conversely, the business class as a whole commonly loses in periods of falling prices. Then, since the same forces tend to keep wages stable, a fall in prices brings loss. Probably wages feel the effect of falling prices less slowly than they do those of rising prices. The employer's superior bargaining power enables him more readily to stave off the loss, just as it aids him in reaping the gain. But some loss there is, for the same fundamental reason — on him falls the first effect of any change.

Whatever the business class thus gains in periods of rising prices may appear to be obtained at the cost of others; and conversely as to their loss from falling prices. What the em-

¹ That is, thru its subsidiary corporations. Between the subsidiary corporations there is nominal purchase of materials.

ployers gain (in the first case), the laborers would seem necessarily to lose. And it is true that the activity and prosperity of flush times are a doubtful boon to the laborers.¹ But in one respect they seem really to gain; employment is more constant, for the pace of industry is more even as well as more quick. Periods of falling prices are more likely to be periods of slackened enterprise and irregular employment. The energy and consecutiveness of operation depend largely on the temper of the business class. They are the leaders, and on their hopes and fears depends the course of modern industry. The gains which are reaped by them in times of rising prices may be needlessly high, and out of proportion to their services to society; but in return something is got in the way of unhesitating and sustained activity.

The effects of falling and rising prices on business profits are modified in that complex case, referred to in the preceding section, where prices and money incomes do not move together. If there be, in consequence of general improvements in the arts, falling prices but stationary money incomes, it would seem that no depressing influence will be felt in business circles. What concerns the business man is not price per unit of product, but total receipts from his output compared with total outlays for that output. He may pay out as much per unit of labor, and receive less per unit of product, and yet may make profits because there is more product per unit of labor — this being the result of greater effectiveness in the processes of industry. On the other hand, if there be rising wages and rising prices, tho' prices rising in the end less high — the sort of movement which is likely to appear when there is growing efficiency of industry and at the same time rapid increase in the money supply — the business class will feel an exhilarating influence no less than in the

¹ It may happen that money wages do not overtake at all the advance in prices. Such seems to have been the result of the great price revolution of the sixteenth century. When this had run its course, prices (of food, at least) had risen more than money wages, and commodity wages had definitely fallen.

On the other hand, during the war of 1914-18, money wages in the United States, tho' they failed to rise as fast as prices in the earlier stages, kept pace with prices in the later. As is pointed out below (Chapter 23, § 6), the monetary phenomena of that time and indeed almost all its economic phenomena, were unexampled.